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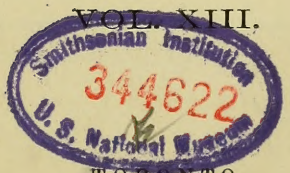
1871-73

VOL. XIII.



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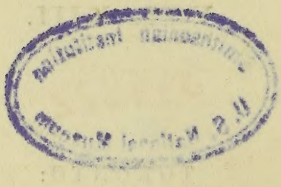

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THE CANADIAN JOURNAL.

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No. LXXIII.—MAY, 1871.

ON MUSEUMS

AND

OTHER CLASSIFIED COLLECTIONS, TEMPORARY OR PERMANENT, AS INSTRUMENTS OF EDUCATION IN NATURAL SCIENCE.

BY HENRY SCADDING, D.D.

Read before the Canadian Institute, January 13th, 1871, as the President's Address for the Session 1870-71.

So many persons had the advantage of examining for themselves the Great Exhibition at Paris in 1867, and such full accounts and profuse illustrations of its contents and surroundings were everywhere to be seen, that it seemed for a long while very much like an impertinence whenever any one proceeded to offer, in any formal way, additional observations on the subject.

It was, I remember, some vague feeling of this kind that induced me to refrain from committing to paper and reading to the Institute, during its session of 1867–8, an abstract of a variety of memoranda made in the Exhibition, and some of the thoughts which could not but be stirred within one by a spectacle so marvellous as that Exhibition undoubtedly was: it seemed foolish to imagine that there was any point in relation to a scene so palpable and accessible to every one, that had not already been well and sufficiently remarked upon.

A considerable interval, however, has now elapsed; and the events of the intervening time have, in the general mind, thrust back the occurrences of 1867 into comparative oblivion. Moreover, some of the most recent of those events have created the probability that such another very perfect international gathering will not again be witnessed for some years to come.

It may consequently be an act less out of place, and of less presumptuous seeming at the present instant, than in some way it appeared to be in 1867, for any one who imagines he has anything to say on the subject, to indulge for a few moments audibly in his recollections of, or deductions from, a display which was so unique, and the witnessing of which could not but form an era in his experience.

I have therefore ventured on this occasion—no other easy subject readily suggesting itself—to offer to the Institute, after all, some of the casual and, as I fear even now it will be deemed, rather unimportant, annotations and ideas, which I did not think it worth while to occupy their time with in 1867–8.

One desire which I found myself haunted with, on returning home fresh from a brief—too brief—inspection of the marvellously diversified, but beautifully classified contents of the Paris Exhibition, was to impress upon all with whom I held any communication, and especially on young Canadians about to travel, the practical, self-educating *use* to which they might put their visits to Great Britain and the continent of Europe, where access is so easy to grand and extraordinary assemblages of objects, industrial, scientific and artistic, either temporary, like the successive international expositions, or permanent but constantly augmenting, like the national museums to be found in capital cities and university towns.

For the most part, I fear, such collections are approached by the tourist, from Canada as from elsewhere, in a light and trivial spirit—are gazed at simply as displays of so many singular, or beautiful, or very useful objects.

But the doctrine which I longed to impress, and which I of course at the same time knew to be neither novel nor abstruse, was, that in the mind of every one about to enjoy the advantage of access to a great classified collection of objects anywhere, there should be a pre-arranged scheme of examination; a certain intention; a definite aim and object: there should be, if practicable, some especial subject of study, or a particular point in some especial subject of real interest to the observer, on which additions to his store of knowledge were sincerely desired. Then, at once, the great museum or other large classified assemblage of objects—although access to it could be had only for a few days, or even for a few hours—ceases to be a mere show or plaything, and is transformed into a gallery of illustration—a delightful and precious instrument of self-education; a means of mental expansion, intellectual

enrichment, and positive increase of personal competency, in whatever sphere of duty the observer may be acting.

And the subject which, amongst a host of others, I thought might conveniently have a large amount of light thrown on it by such extensive collections as those to be met with at the present day in Great Britain and on the continent of Europe, was Natural Science, in some one or other, or all, of its divisions, of Mechanical Philosophy, Chemistry and Physiology.

Natural Science is a subject which is now more or less attended to in all our schools, I believe; but of course only its most elementary principles are expounded there; and the appliances for illustration are, of necessity, circumscribed and meagre.

A few days, or even hours, judiciously spent in some such collection as that which was to be seen in the Universal Exhibition at Paris, by a youth familiarized with and interested in the elementary principles of Natural Science, might be productive to him of results of life-long importance. Not only, in a general way, would his mental view be likely to be widened, but his profession or career might be happily decided by an extra impulse there given to a taste, tendency or talent; and a hint, or idea, caught from things and processes then for the first time seen, might lead in practice afterwards to fame and riches, and to the increase of a country's resources.

With the hope that even a rapid *sketch* of that collection may, here and there, contribute slightly to like positive results, I now proceed with my proposed annotations, purposing to add afterwards a brief notice of the Museum at Oxford, and of one or two other kindred establishments.

The Champ de Mars in Paris, the plot of ground on which the Exhibition of 1867 took place, is an area of 103½ acres. The whole of this space was required for the purpose, and fifty acres more in the island of Billancourt, a few miles down the Seine. In Billancourt the agricultural objects were to be seen, and experiments in scientific agriculture were performed. Here competitive experiments with ploughs and other instruments worked by steam were carried on, exhibiting the comparative effects of animal and machine labour, and showing the possibility of the application of mechanical force to cultivation even on a small scale. Here were machines for drill-sowing and reaping in operation. Grass was cut, turned over and raked, and made up into heaps, by machinery. Here was a miniature dairy-farm, on which

economical processes for the preparation of food for cattle were going on; and the manufacture of butter, cheese, oil, cider and *piquette*, a kind of sour wine made from unripe grapes, and much drunk by the peasantry of France. Modes of preparing different manures were shewn. The basket-maker, the cooper, the wooden-shoe maker, the farrier, the blacksmith, were all plying their respective trades, aided by the most ingenious mechanical contrivances.

Incessant communication was maintained with the island of Billancourt by rail and steamboat.

Of the 103½ acres contained in the Champ de Mars, the Exhibition building itself, or Palace proper, covered 31½ acres (153,194 square yards). The space outside the Palace was styled the Park. An innumerable multitude of buildings were here to be seen in every variety of form—kiosks, pavilions, châlets, churches, chapels, bell-towers, schoolhouses, barracks, temples, palaces, huts, Tartar wigwams, theatres, stables, windmills, bath-houses, conservatories; with several real lighthouses, one of them 220 feet in height, displaying at night the electrical light. The edifices just spoken of were scattered about most promiscuously, as it might seem; but each had its relation to one or other of the exhibiting nations, and each gave shelter to and conveniently displayed some special product or products of that nation, natural or artificial. Although at the first glance the paths leading to these buildings seemed labyrinthine enough, by the aid of a plan no great difficulty was found in threading one's way to any desired point.

Very conspicuous in the western portion of the Park, on the avenue leading towards the Military School, was one object which quickly fixed the eye, and which even in 1867 was regarded as ominous. This was a bronze equestrian statue of King William of Prussia, raised aloft on a high pedestal, of colossal dimensions, and crowned with laurel. Towering up to a height of twenty-five feet, it seemed to dominate the western portion of the Park. It was in jest likened at the time to the fatal Horse which found its way into the heart of Troy. It was little imagined that the comparison was destined to be so nearly exact as it has proved. Another ominous Prussian object, in another place, filling every beholder with awe, was the so-called Krupp gun, a cast-steel breech-loading cannon, weighing with its carriage 141,062 lbs. To enable this monster to reach Paris, the railway bridges in some places were strengthened. A multitude of other kindred implements of destruction accompanied it. Sorrow and shame, and indignation, could

not but be stirred by the reflection that such, after all, were the *ultimæ rationes* of European diplomacy. Rossini's hymn, too, composed for the occasion of the distribution of the awards at this Exhibition, and there rendered with orchestral accompaniments and appliances of the grandest description, wound up, ominously, as was observed at the time, with the tolling of bells and the booming of cannon.

But to proceed. The Palace itself, the Exhibition proper, was a structure of iron, having the appearance of being an ellipse in outline, but in reality it was a square, with semicircles attached to the north and south sides. Its circumference measured just a mile. The whole was only of one storey. Fatigue in visiting its parts was thus diminished. To examine cursorily the contents of the Palace, it was necessary to perform the circuit of it at least eight times. It was divided into zones or bands, concentric, so to speak; and these zones or bands were cut into sections by passages radiating from the middle area of the building. Each of these radiating passages had a distinguishing name. Associations unthought of in 1867 would now attach to some of the titles on the French side of the Palace, as, for example, Rue d'Alsace, Rue de Lorraine. The central area of the building was a beautiful ornamental garden-plot, with flowers, fountains, and an abundance of statuary in marble. Its dimensions were 460 by 180 feet. In the middle of the garden was a pavilion or temple, in which centred, of course, the apices of all the areas occupied by the several nations, bounded respectively by the radiating passages and segments of the elliptical circumference. The use to which this temple was put will be presently mentioned.

To one passing through the zones or bands, the objects exhibited appeared arranged according to the place of production of each; but to one passing up or down the radiating passages, the same objects appeared arranged according to the nature of each. This was an ingenious and very interesting contrivance.

Nine-tenths of the east half of the building was occupied by France, the remaining tenth by Belgium and the Netherlands.

The west half was occupied, largely, by England and her Colonies; by the States of North and South America; by Spain and her colonies; by Russia, Austria, North and South Germany; and, in slips, narrow as compared with the spaces occupied by the other nations, by Switzerland, Portugal, Greece, Denmark, Sweden, Norway, Italy, Rome,

the Danubian Principalities, Turkey, Egypt, China, Japan, Siam, Persia, Tunis and Morocco.

The place of Canada in the great industrial, scientific and artistic Cosmos was discoverable, but not immediately obvious. Australia, I remember, asserted itself much more decidedly, and showed greater individuality. And herein a fact is symbolized. Australia, as a great region of the Greater Britain, is much more accurately realized, I think, in the common mind of the mother-country, and of Europe perhaps, than is Canada. Canada lies in the shadow cast by the great pyramid thrown up, or being thrown up, on its southern side, and is but dimly seen. It is still, to a great extent, thought of, not as a vast region filled or filling with millions of English-speaking workers, emigrants from the British Islands, but as a French colony in the military occupation of Britain. Even at the Exhibition in Paris, prominent objects to be seen in the Canadian slip, as well as the names of several of the Canadian commissioners, served to perpetuate the impression in regard to Canada to which I have alluded.

But again to proceed: The temple or pavilion in the midst of the central garden contained specimens of the coins, weights and measures used in the countries enumerated, those of each country respectively being placed in the apex of the section occupied in the elliptical area by that country.

The first circuit of the Palace by the passage next to the central garden was made through what was entitled the Gallery of the History of Labour. This was a classified museum of the archæology of each country. A means of judging of the progress made in the successive centuries by each country, in industry and art, was thus afforded. To this collection the choicest and most curious objects were sent from the public repositories in each country; and it is supposed there had never before been presented at one view such an assemblage of the relics of past ages.

It will give an idea of this remarkable gallery if I set down the subdivisions in the French portion of it, an analogous classification being adopted, so far as was practicable in the space occupied by the other nations. French archæological objects were arranged under the heads of—Gaul before the use of metals; Independent Gaul; Gaul under the Romans; The Franks to the Coronation of Charlemagne (A.D. 800); The Carlovingians, from the beginning of the 9th to the end of the 11th century; The Middle Ages, from the beginning of the 12th century to

Louis XI. inclusive; The Renaissance from Charles VIII. to Henry IV. (1610); The Reigns of Louis XIII. and XIV. (1610 to 1715); The Reign of Louis XV.; The Reign of Louis XVI. and the Revolution (1774 to 1800). In the parts of this gallery devoted to the early portion of the mediæval period, splendid manuscripts and illuminations constituted a striking feature. The identity of style observable in the illuminations of certain very ancient Persian or Arabian manuscripts here shown, and those which decorate the productions of the Greek and Latin monasteries, was very curious to notice.

In the Swiss portion of this gallery were to be seen innumerable relics of the famous primitive lake-villages, built on piles, which have recently been discovered, and which Arthur Helps has endeavored so pleasantly in his *Realmah* to rehabilitate and people with a wise and understanding set of inhabitants. These remains were referred to ages of stone, bronze and iron. Pictures reproducing these ancient Swiss villages were also displayed.

The next circuit of the building to be made was through the Gallery of Fine Arts. Each circuit, of course, became larger as one advanced outward. This gallery was filled with paintings, drawings, sculptures in groups, single figures, busts and medallions; drawings and models in architecture, engravings and lithographs. Vela's *Napoleon Mourant* was ever surrounded by a throng, watching the figure as though it were a flesh-and-blood reality. The *Columbus revealing America* of the same artist, a colossal group, was especially interesting to persons from the Canadian side of the Atlantic. *An Episode of the Deluge*, by Luccardi, obtained the highest prize in sculpture, with the Cross of the Legion of Honour added to it—a fine group, representing a father and mother and infant child, the waters just reaching them.—Whilst engaged in making memoranda on the spot of several special coins in a fine ancient collection in the Italian section, I noticed close at hand the quiet *hist!* of the police, indicating that one was being watched. The special coins pencilled down on this occasion, as not having been seen before, were, I find, a Livia as Justitia, a Livia as Pietas, a Manlia Scantilla, a Lucilla, a Paula, an Orbiana, and a Galeria Valeria; with a Pupianus, a Balbinus, and a Romulus Augustulus.

Again we passed round through the building. Now it was through a gallery bearing over its entrances the inscription—The Materials of the Liberal Arts. These were found to be paper for printing purposes and all purposes; letter-press and printed books; book-binder's work;

drawing materials; applications of drawing and modelling to the useful arts; photographs; musical instruments of all kinds; medical apparatus and surgical instruments of all kinds; things defined to be "instruments of precision, and material for teaching the sciences," that is, astronomical and land-surveying instruments, theodolites, &c., thermometers, barometers, hygrometers, maps geological and otherwise, and plans in relief. Especially noticeable among "printed books" were magnificent large-paper copies of Louis Napoleon's Life of Cæsar, a production likely to be classed hereafter among the curiosities of literature, its author and his position at the time of its composition being considered.

One always knew when he had completed the circuit of the building by finding himself again in the grand vestibule, a wide and noble passage leading straight from the principal entrance of the Palace to the central garden; a passage usually thronged with a mixed multitude, and itself supplied with objects of interest, as, for example, a succession of magnificent specimens of prize plate, won in England by French horses. At several points along the middle of this passage were circles of seats or divans. A vacant spot on one of these was often anxiously watched for in vain by the wearied investigator.

Proceeding again still outwards, we entered the next gallery. This was styled the Gallery of Furniture; in French briefly *Mobilier*. This term included an immense variety of things: furniture literally, of the most elaborate description; inlaid woodwork, picture frames, paintings on wood, tapestries, carpets, crystal, ornamental glass, window glass transparent and opaque, pottery, cutlery, silver and gold ware, works of art in bronze, silver and iron, watches, chronometers, clocks, heating and lighting apparatus, objects in morocco, brushes, products from woody fibre, &c. Among articles of furniture exhibited was "the cradle of the Prince Imperial." On coming suddenly upon this object, I remember thinking its display here a slight overtax on the public curiosity. A resplendent dinner set in silver gilt, the property of the Emperor, duly arranged on a long dining-table, was also exhibited.

The gallery into which we next passed had the inscription "Vêtement" over it—"Clothing." Here, in addition to articles of dress of all kinds and in every grade of magnificence, we find cotton, hemp and flax fabrics in infinite variety, silk tissues, combed and carded wool, lace, muslin, embroideries, artificial flowers, caps, hats of straw and all other customary material, head-dresses and shoes, precious stones,

enamels, engraved jewellery. Here also were portable fire-arms, travelling apparatus and toys. Life-size and life-like figures, carefully dressed in the costumes of different countries, and of various provinces of different countries, literally "from China to Peru," were set up in divers places within this gallery. The large groups of real precious stones of every name, and of jewel-sets in every variety of form, contributed, not only by numerous manufacturers, but by imperial, royal and other personages in different parts of Europe, were quite fairylandish in character. Here, for one thing, was to be seen the Sancy diamond, once the property of our James II., and sold by him to Louis XIV. for £25,000. In another place I remember a cluster of unwrought emeralds, shown as found in a Russian mine—a number of long, thick, six-sided crystals, of a pure green colour, bristling out irregularly from the sides of a great block of the whitish matrix in which they had been formed.

Another gallery was now to be examined. This was entitled the Gallery of Raw Materials; in French "Matières Premières."

This, though the least showy, was possibly the most instructive of all the galleries to the student. Here the observant traveller, with a design of increasing his practical acquaintance with the products and applications of Natural Science, would have reaped a rich harvest. Here, if the visitor had the time, he could be deliberate, and be but slightly disturbed; for generally speaking the crowd was not great in this zone of the Palace. Here were collections and specimens of rocks, minerals and ores, ornamental stones, marble, serpentine, onyx, hard rocks, refractory substances, earths and clay, sulphur, rock salt, salt from salt springs, bitumen and petroleum, specimens of fuel in its natural state and carbonized, compressed coal, metals in a crude state pig-iron, iron, steel, cast steel, copper, lead, silver, zinc, alloys, products from the washing and refining precious metals, gold beating, electro-metallurgy, objects gilt, silvered or coated with copper or steel by galvanic process, products of the working of metals, rough castings, bells, wrought iron, iron for special purposes, sheet iron and tin plates, iron plates for casing ships, copper, lead and zinc sheets, manufactured metal, blacksmith's work, wheels, tires, unwelded pipes, chains, wire-drawing, needles, pins, wire work, and wire gauze, perforated sheet iron, hardware, ironmongery, edge tools, copper and tin ware, other metal manufactures. Such a detail as this of objects, spread over only a very small portion of the Gallery of Matières Premières, gives an idea

of the enormous multitude of matters and things displayed; in the midst of which nevertheless reigned the most perfect order, making examination and study quite possible. Without again being as specific, it will suffice to say, that after these products of mining and metallurgy just named, came products of the cultivation of forests and of the trades appertaining thereto. Then, the products of shooting, fishing, and of the gathering of fruits obtained without cultivation. Then, agricultural products (not used as food), easily preserved; which included among other textile materials, such as raw cotton and hemp, the cocoons of silk worms. Then came chemical and pharmaceutical products. Then specimens of the chemical processes for bleaching, dying, pointing and dressing. Then leather and skins, including gut work. The whole of the Russian department was redolent of Russia leather.

We reached now the sixth gallery, which was nearly a mile round and of extra dimensions. This was the Gallery of Machines, of apparatus and processes employed in the common arts.

All along its middle space was a slightly raised platform, on which appeared a forest of cast-iron with a plentiful undergrowth of the same material; mechanisms great and small applied to every human purpose, most of them busily in action. Here were railway apparatus, telegraph apparatus, civil engineering apparatus, architectural apparatus, navigation and life-boat apparatus.

I subjoin an extract from my memoranda :—

"I next undertake the outermost gallery, that of Machines. This is nearly a mile round: it ought to be journeyed through twice for even a cursory view of it, as there is a highway on each side of the central roped-off space in which for the most part the machines are placed, while there is a vast display also of objects round the whole of the sides of each of the passages opposite to the central enclosed space. This part of the building is about twice the height of the interior zones, to give room for machine-structures of considerable altitude when set up. The restless sound of innumerable machines at work is immediately to be heard; their movements also strike the eye; the smell of oil and oily steam salutes the nostrils, but only faintly; the furnaces, the generateurs de vapeur, are placed at intervals outside. Entering as before on the French side I notice a gigantic trophy of iron and steel bars ready to be converted into anything. I pass cannon, fire-engines, looms for all fabrics at work, steam-engines of an endless variety of construction, circular saws, brick-making machines, gigantic organs here and there pealing out grand music occasionally amidst the confused machine-babel, steam-pumps bringing in actual rivers of water, distilling apparatus, sugar-making apparatus, models of ships-of-war with their machinery of propulsion. In Prussia,

cannons—one monster weighing fifty tons; revolving cannon; ambulances; a triumphal arch of imitation marble. In England, locomotive engines; donkey engines; printing presses; electric printing presses; wood-cutting machines; carding machines for wool, cotten and flax; lanterns for lighthouses; coaches; hat-making, sugar-plum-making and sewing machines. Near one of the entrances to this gallery I noticed a gilded pyramid representing the gold produced from the mines of Victoria, in Australia, in fifteen years, viz., 1851–66; its base, 10 feet square; its height, 63 feet; its solid content, 2,081 cubic feet; value represented, one hundred and fifty millions sterling. In the Australian compartment was a model of a £10,000 nugget."

The outermost circle of all was the Gallery of Food and Drinks: Aliments et Boissons. This gallery was open to the Park all round the exterior wall of the Palace. A projecting verandah-roof extended out over the whole of it. Underneath, in addition to a scientific display behind glass of all sorts of substances in any way connected with the edible and the potable, there was a series of real restaurants, one after the fashion of one nation another after the fashion of another. These establishments were usually thronged, and the scenes presented in a promenade round the whole of the exterior of the Palace were those of a well-peopled Parisian boulevard.

Of the wonderful Park in the midst of which the Palace stood, I have already briefly spoken. I may add that a meandering stream, a cascade and a lake, all artificial, gave variety to its French portion. Also two immense aquaria are specially recalled, one of salt water, the other of fresh, underneath which the visitor might go and see a variety of strange fish sporting above his head as though he were at the bottom of the sea.

A magnificent velum or tapestry awning, green in colour and sprinkled over with golden bees, had a grand classic effect, stretched over the whole of the wide avenue leading from the entrance gate by the Seine up to the principal entrance to the Palace, sustained at regular distances by lofty poles bearing long pendant gonfalons.

Though the Palace with its innumerable satellite appurtenances quickly vanished like a vapour, records of its existence and system were made. The story of its beautiful exemplification of law and order in the midst of an unparalleled multiplicity remains; and that, as I have already hinted, may serve in instances here and there to assist a thoughtful youth to methods by means of which he may, if he will, divide and conquer the domain of human knowledge, and especially that province of it which is occupied by Natural Science and its practical applications.

The career of Napoleon III., the originator of the spectacle which rendered 1867 so memorable, will doubtless hereafter be employed, after the traditional fashion, to point a moral and adorn a tale. He will be one more conspicuous instance of the instability of human greatness. He will be parallelled perhaps in sentimental strain with Crœsus. Solon had said to Crœsus, when displaying to him his magnificence as King of Ionia, "No one while he lives is happy." When in the grasp of Cyrus, Crœsus recalled with groans this saying of Solon. The oracle had said to Crœsus, "Go up against Persia, and thou shalt destroy a great empire." He went up accordingly, but with the fate that has befallen Napoleon. With reason did he, when in durance, send to ask of Apollo if he were not ashamed of having encouraged him, as the destined destroyer of the empire of Cyrus, to begin a war with Persia, of which such were the first fruits; and with equal reason did Apollo reply, "When the God told him that if he attacked the Persians, he would destroy a mighty empire, he ought, if he had been wise, to have sent again and inquired which empire was meant, that of Cyrus or his own." Again, *mutatis mutandis*, the words of Crœsus to Cyrus might be addressed by Napoleon to William of Prussia, "What I did, O King, was to thy advantage, and to my own loss. If there be blame, it rests with the God of the Greeks, who encouraged me to begin the war. No one is so foolish as to prefer to peace war, in which instead of sons burying their fathers, fathers bury their sons. But the gods willed it so." And this convenient shifting off from human shoulders of the burden of responsibility would probably be accepted with complacency by the Prussian King.

The words, however, of Napoleon III., which in connexion with the Exposition of 1867, I was purposing to quote, when this digression was induced, were these:—"The Exhibition of 1867," he said, in the really noble address which accompanied the delivery by himself of the medals to the successful exhibitors, "will, I hope, inaugurate a new era of harmony and progress. Assured that Providence blesses the efforts of all those who, like ourselves, wish to do good, I believe in the final triumph of the great principles of morale and justice, which, by satisfying all legitimate aspirations, can alone consolidate thrones, elevate the people, and ennoble humanity."

These words, heard now amid the dreadful echoes which every hour reach us from what was beautiful and comparatively prosperous France, have a strange and hollow sound. They may, in spite of appearance,

yet prove true, although the issue may be brought about otherwise, than as the speaker imagined. The most acute of men are often at fault in their foresight. When the "Emperor of the French" pronounced these noble words, he was surrounded by a group such as may possibly be never seen assembled together again. On his right hand sat the Sultan himself, Abdul-Azziz-Khan; there sat also the heir apparent of England, the heir apparent of the Netherlands, his own son, the heir apparent of France, the Prince of Saxony, Prince Teck, the Duke of Cambridge, the Duc d' Aosta. On his left were to be seen the heir apparent of Prussia, the heir apparent of Italy, Prince Hermann of Saxony, Prince Napoleon, the Duke of Leuchtenberg, Mohammed-Mourat-Effendi, Abdul-Mamid. Behind him and the Empress were arranged, besides a number of Princesses and Duchesses, the eldest son of the Sultan, the brother of the (so-called) Tycoon of Japan, Prince Lucien Murat, Prince Joachim Murat, Prince Achille Murat, Prince Napoleon Charles Bonaparte, with the great officers of imperial France and the suites of the foreign Princes.

All of this assemblage, with thousands of others present, applauded the exalted ideas of Louis Napoleon at the moment doubtless with sincerity; and all anticipated possibly as little as the speaker himself the bewildering collapse which was about so swiftly to ensue.

Nevertheless no thoughtful person familiar with the history of man in the past can doubt of the progress of man in the future. That progress will no doubt still be beset with impediments, as usual; but its rate may, in the age which is close at hand, be accelerated.

Unparalleled disasters have fallen upon Europe. *Quidquid delirant reges, plectuntur Achivi,* has proved true again, and this time on a scale more gigantic than ever. On a scale more gigantic than ever have the many been made to suffer by the few. The rivalry, the ambition, the caprice of rulers have brought lamentations, and mourning, and woe into every household of the ruled. Will not the very enormity of the desolations created hasten the day when nations, peoples and languages will effectually secure themselves against an evil so dire? Through the reaction which is sure to ensue on the termination of the existing most lamentable condition of things, is it not reasonable to hope that peace and happiness, truth and justice, will more rapidly and widely prevail among men in the immediate future, than they have done in the past?

I now ask you to transport yourselves in imagination from the City of Paris to Oxford.

The Oxford Museum (the New Museum, as it is there called) is contained in a range of buildings 236 feet in length, of the style of the 13th century, and situated in a large airy park. The Canadian is at once struck by a certain resemblance which it bears to University College, Toronto. In the interior of its central part is a fine quadrangle, a perfect square, each of the sides 76 feet in length. This quadrangle is roofed over with glass. Around this square is a series of rooms, four of them fitted up for lectures, with flights of seats descending down to a table for the lecturer. One of the lecture-rooms is for chemistry, another is for experimental philosophy, another is for mineralogy and geology, and the fourth is for medicine. The other rooms are Professors' work-rooms, store-rooms, sitting-rooms, apparatus-rooms and laboratories; in the anatomical part of the building I observed a Macerating-room; to the chemical portion of the building there are attached balance-rooms. Almost detached outside, at one corner is the principal laboratory, a reproduction of the Abbot's Kitchen at Glastonbury. This almost separate building, circular, with conical roof, helps the general resemblance to the Toronto University building, although its position is towards the right and not towards the left. The circular laboratory at the Toronto University is, by the way, not a reproduction of the Abbot's Kitchen at Glastonbury; but, less appropriately, of the Round Church at Cambridge, commonly called St. Sepulchre's, built after the pattern of the Church of the Holy Sepulchre at Jerusalem. Round the whole of the interior quadrangle of the Museum at Oxford runs a corridor or arcade sustaining a gallery or upper corridor. Double rows of slender metal columns sustain the lofty glass roof. On the left as you enter are the anatomical and physiological collections; on the right the mineralogical collections. In the middle, on each side of the central passage, are zoological collections. Along the side opposite to the entrance are palæontological collections.

Round three sides of the upper corridor are also rooms as below: the whole of the front side is taken up with a library and reading room, the latter containing the more recent books, the scientific transactions and periodicals. On the left is a very spacious general lecture room; also an anatomical lecture room, with professor's and students' sitting-rooms. On the right is another lecture room, and rooms for an astronomy professor and a geometry professor. There is also up here an entomological museum with a curator's room.

The general contents of a great college of science, so to call it, like the building just briefly described, can be conceived, and I shall not enter into many particulars. It should be said, however, that the Oxford Museum contains the collections of the celebrated Professor Buckland, and is rich in its palæontological department. The extinct forms of life that have existed on the globe are here seen, so far as their remains have been found, in a connected series; specimens in abundance of the palæozoic, mesozoic and cænozoic fossils. Here are veritable plesiosauri (not casts), veritable icthyosauri, megalosauri, pterodactyles, deinotheria, elephantes primogenii. There is also a very striking collection, as it seemed to me, of beautifully prepared skeletons (all properly articulated and set up in easy natural attitudes) of beasts, birds, reptiles and fish; the interior bony framework of each creature as marvellous to behold as its outward presentment when clothed with flesh and adorned with feathers, hair or scales.

There is one feature in the interior of the museum which possesses great interest. The series of pillars which support the lower and upper arcades subserve a scientific purpose. They are, all of them, geological specimens on a large scale systematically arranged. The shafts on the west side are respectively, grey granite of Aberdeen, red granite of Peterhead, porphyritic grey granite from Cornwall, green syenite from Leicestershire, pale-reddish granite from Argyleshire, red granite of Ross in Mull. On the north side the shafts are, Devonian limestone from Torquay, mountain limestone from Cork, mountain limestone from King's County, green serpentine from Galway, mountain limestone from Limerick, mountain limestone from Cork, Devonian limestone from St. Mary Church, and so on all round the lower quadrangle; and again all round the upper gallery, the shafts of the columns follow in order of geographical age and succession; in all 125 columns.

Moreover the elaborately carved capitals of these columns, together with a series of sixty corbels built into the walls, also elaborately carved, are made to illustrate systematically the vegetable kingdom. On them are sculptured, in such order as may assist the memory, and with such attention to their natural aspect as may satisfy the botanist as well as the artist, specimens of all the genera of plants and flowers. The capital of the column of porphyritic grey granite, for example, mentioned a moment ago, is formed of leaves of the date-palm; the two adjacent corbels of leaves of the fan-palm; the three together illustrate the palmaceæ. Again, the red granite column from Ross in Mull, and its

two accompanying corbels, present specimens of the Liliaceæ, viz., the yucca, the aloe and the lilium, tulipa and fritillaria. The capital of the mountain limestone column from Limerick, and the two neighbouring corbels, exhibit wheat, barley, oats, Indian corn, sugar cane (with sparrows thereon), rice and canary grass, with buntings and canaries and quails thereon; these to illustrate the gramineæ. The Filices are represented by the capital of Devonian limestone from St. Mary Church, and the adjoining corbels, which consist of ferns, the hart's tongue, lastræa cristata, scolopendrium vulgare, blechnum boreale, and the mallow. The capital of a column of black serpentine from the Lizard in Cornwall, and two corbels, are devoted to the Dioscoraceæ, being sculptured over with small-leaved bryony, black bryony, and elephant's foot.

Another feature in the architecture of the Museum is very interesting, and possibly peculiar to itself: the elaborate and very ornamental ironwork in the spandrels that branch out from the metal pillars sustaining the glass roof, is made artistically to represent the foliage of the following thirteen trees: chamærops humilis, carica papaya, acer pseudo-platanus, tilia europæa, tussilago farfara, æsculus hippocastanum, cocos nucifera, musa paradisiaca, quercus robur, platycerium alcicorne, musa cavendishii, juglans regia, caryota urens.

One more feature must be noticed, which, to myself at least, afforded infinite pleasure: all round the quadrangle, against the piers of the arcade, there were arranged full-length life-size figures of the following world-famed scientific worthies, finely conceived and exquisitely sculptured in white stone: Aristotle, Hippocrates, Euclid, Galileo, Bacon, Newton, Leibnitz, Harvey, Davy, Priestley, Watt, Linnæus.

Altogether, the Museum at Oxford was a very fascinating place. With its library, reading room, lecture rooms, appointed lecturers, varied apparatus, and studied ornamentation, it seemed more like an institution in Plato's Atlantis, or More's Utopia, than a thing of the present day. It was a beautiful realization of a true *Μουσεῖον*—of a home of the Muses; of those of the Nine, at all events, who preside over the departments of Natural Science and Medicine.

Since 1850, much encouragement has been offered at Oxford to the study of Natural Science. After the lapse of seventeen years, I expected, in 1867, to find the number of those who were applying themselves with enthusiasm to the subject to be large; but I was surprised to find it to be still comparatively small. The *vis inertiæ* of

the old system, which practically excluded Natural Science, is very great; and although rewards are now offered in the University, as also of late too in most of the old endowed schools, for proficiency in the subject, the majority of those who preside over ancient educational institutions do not heartily recommend the subject to the attention of the youth under their charge. In 1861, out of 295 who took their B.A. degree, 45 had been students in the Natural Science school; of whom 13 only were classed, and 32 passed. In 1862, 335 were graduated; 41 of these were Natural Science students, 12 of whom were classed, and 29 passed. In 1863, 317 obtained B.A. degrees, 8 were classed in Natural Science, and 14 passed. In 1864, 281 graduated; of whom 10 were classed and 9 passed in Natural Science. In 1865, out of 276 B.A's, 12 were Natural Science students, of whom 10 were classed and 2 passed. In 1866 the numbers were: in Literis Humanioribus, 258; in Scientiâ Naturali, 8; of whom 7 were classed and 1 passed. In 1867, 295 graduated; 14 in Natural Science, of whom 9 were classed and 5 passed. Thus we see the number of those who have sought distinction in this department of study has been fluctuating and never large, considering the intrinsic interest and practical value of the subject, the opportunities and facilities offered, and the rewards to be obtained. Several of the Colleges have scholarships for the best candidates in Natural Science. Miss Burdett Coutts has, in recent times, founded so-called Geological scholarships, for which the examinations include Physiology, Chemistry and Experimental Physics. Every year a Travelling scholarship, worth £200, for three years, is obtainable, on what is called Dr. Radcliffe's Foundation, by the best candidate among those who have taken a first class in Natural Science, and who purpose entering the medical profession.

As to the qualifications of successful candidates in the school of Natural Science at Oxford, from passmen a general acquaintance with the principles of two of the three subjects of the course, viz., Mechanical Philosophy, Chemistry and Physiology, is required; and familiarity with a special subject in Mechanical Philosophy, as Hydrostatics, Pneumatics, Light, Heat, &c. From classmen a certain knowledge of all the three branches is required, to which must be added a more extensive acquaintance with one or other of the three, including a special subject in that branch for more minute examination. A classman, for example, may take up Physiology as his principal subject, and Osteology as the special subject included under that head. Of Mechanical Philosophy

and Chemistry, he would only be expected to have a good general knowledge. Under Mechanical Philosophy, it may be proper to add, are included Mechanics, Hydrostatics, Pneumatics, Acoustics, Light, Heat, Electricity and Magnetism. In Chemistry great stress is laid in the final examination on Analysis. A knowledge of some part of Organic Chemistry is required, as, *e. g.* the Alcohol series. When Mineralogy is offered as a subject, some special branch, such as the optical properties of crystals, must be studied. Classmen in Physiology are required to exhibit skill in dissection. Special instruction on this subject is given by a professor or lecturer in the University, styled Lee's Reader in Anatomy. The present occupant of this important lectureship is Mr. Barclay Thompson, a brilliant alumnus and graduate of the University of Toronto. Special subjects that are taken up for examination under the head of Physiology are, as has been already said, Osteology or Odontology; one of the functions, as circulation; the functions of any group of animals, as, *e. g.* fish or molluscs; the nerves; Ethnology also, Botany, Geology and Palæontology.

Another famous museum at Oxford is the Ashmolean, built in 1679. The portion of its contents really useful for scientific illustration has been removed to the new museum just now described. The remaining objects constitute simply a collection of mixed curiosities. In the basement of the Ashmolean are deposited the celebrated Arundel Marbles. The inscription over what was originally the principal entrance of the building is "Museum Ashmoleanum: Schola Naturalis Historiæ: Officina Chymica." The term "Naturalis Historia," as used by Elias Ashmole, included of course, what we now understand by Natural Science, just as the renowned Natural History, so-called, of Pliny is in fact a cyclopædia of the Natural Science of Pliny's age.

In the University of Cambridge since 1848 there have been, as at Oxford, instituted special examinations for honours in Natural Science. The system of study pursued previously at Cambridge involved the necessity of attention to many branches of Physics. The examination for honours in the Natural Science Tripos at Cambridge requires an acquaintance with the following subjects:—Human or Comparative Anatomy, Physiology, Chemistry, Mineralogy (excluding the Mathematical part of Crystallography), Botany and Geology. In a calendar that happens to be at hand I observe valuable papers set at the Natural Science Tripos Examinations by the Professors of Chemistry, Mineralogy, Botany, Anatomy and Geology, and the Regius Professor of Medi-

cine, viz., Profs. Cumming, Miller, Henslow, Clark, Bond, Sedgwick and Paget. I give one question from each of these papers. In the paper on Chemistry it is asked "If nitric acid is decomposed by voltaic electricity, in what direction are its elements separated?" In the paper on Mineralogy it is required to "Enumerate the systems of crystallization in which double refraction has been observed? Describe the situation of the optic axis or axes with respect to the figure of the crystal in the pyramidal, rhombohedral, prismatic and oblique systems?" In the paper on Botany the examinee is required to "Describe the diseases in wheat termed ear-cockle and ergot." In the paper on Comparative Anatomy it is asked "Have any of the ringed worms true joints?" In the paper on Physiology it is asked "What appears to be a principal office of the pancreatic fluid according to Bernard? By the selection of what species of mammal for his experiments was he enabled clearly to distinguish between the action of the bile and that of the pancreatic fluid during life?" In the paper on Geology it is asked "What evidence have we for a 'glacial period?' Assuming its existence as a fact in the history of the earth, how do we fix its geological date?" In the "general paper" we have the queries :—"How do we discover the mean density of the earth?" "What are the indications of its primeval fluidity?" "What are the present indications of an increasing internal temperature?" "State some of the modern theoretical investigations bearing upon the question of the actual internal fluidity of the earth, and the results derived from them."

The Fitz-William Museum at Cambridge is not peculiarly adapted to the necessities of the Natural Science student. It is a magnificent collection of sculptures, paintings and books. Institutions that help to the attainment of honours in the Natural Science Tripos at Cambridge are the Anatomical Museum, the Geological Museum, the Mineralogical Museum and the Botanical Garden.

It would be superfluous to attempt a sketch of the British Museum in London. In a collection so extensive and so scientifically arranged the devotee of any speciality in Natural Philosophy will of course find what will delight and instruct him. I will only add for the benefit of any who are interested in meteors and aerolites that here they may see and closely examine many hundred of these petty but eccentric and not unformidable members of our system. After contemplating thoughtfully the aspect, size and weight of several of these stray vagrants from the outer space, all of which must be well-authenticated

or they would not be deposited here, no one can fail to regard with increased curiosity the so-called shooting stars to be seen every night in the heavens, but especially the November and August showers; and no one can fail to feel in an intensified degree thankful that disaster to cities and men from the impact of such masses on the Earth is so rare.

In the north gallery of the Museum are between two and three hundred specimens of meteorites, classed as aerolites, siderolites and aerosiderites. The first are meteorites, containing from the most part various silicates, interspersed with isolated particles of nickeliferous native iron and meteoric pyrites. The second are meteorites, consisting of nickeliferous native iron in a more or less continuous or sponge-like state, cavities in which are charged with silicates. The third are masses of native iron, generally nickeliferous, and containing phosphides of nickel and iron, carbon and other substances. One found in Yorkshire weighs 45lbs. 8oz.; one found in Tennesee weighs 60lbs.; one found in Oldenburg, in Germany, weighs 77lbs.; one found at Parnallee, in India, weighs 134lbs.; one found at Tolucca, in Mexico, weighs 173lbs. 9oz.; one found at Tucuman, in the Argentine Republic, South America, weighs 1,400lbs.; finally, one found at Cranbourne, Australia, weights 8,200lbs.—The so-called Blacas collection, purchased by the British Government in 1866, for the sum of £43,000, consisting of antique gems, cameos, coins, Roman plate, bronzes, painted vases, frescoes, and defensive armour, may also here be examined. It has its name from the Royalist French Dukes of Blacas. The number of engraved gems, cameos and intaglios which it contains is about 800. It has also some fine specimens of ancient phaleræ or horse-ornaments—large silver plaques, with crescents appended.

Other scientific collections in London are the Museum of Economic Geology; the Royal Society Museum; the Museum of the Royal College of Surgeons; the Soane Museum; the India House Museum; the Linnæan Society Museum; the Horticultural Society Gardens; the South Kensington Museum; the Botanic Garden at Kew, where there is a grand palace of glass, 360 by 90, filled with palms. Here also is to be seen the gigantic lily, named the Victoria Regia. The wonderful Crystal Palace at Sydenham, with its surrounding domain can be put to scientific use in many ways by those who pay their visit with that intention. Some life-size models of the animals of the palæontological class, seen in the open air in their proper habitat, in the act of crawling up the green bank of a breezy lake give a vivid im-

pression of the shape and magnitude of those now extinct forms of life. The Palace at Sydenham is a perpetuation of the Universal Exhibition Building of 1871, only greatly extended and enlarged.

The felt utility of the great temporary assemblages of objects at international and universal exhibitions, as instruments of education, has been a stimulus to the improvement of museums, and has led to the establishment on a large scale of permanent exhibitions scientifically arranged.

Adjoining the Horticultural Gardens at Kensington there have just been erected magnificent permanent exhibition buildings, 550 feet in length; and close by them is to be seen the beautiful Rotunda or Colosseum, entitled the Royal Albert Hall of Arts and Sciences. It is elliptical in form, its axes being 219 and 185 feet. A beautiful external feature of the building is a band or frieze six feet six inches in length carried round its whole circuit, 794 feet, towards the top, crowded with groups emblematic of the arts and sciences and industries, executed partially in colours in terra-cotta. The subjects are agriculture, astronomy, geology, workers in wood, and stone, and iron, music, poetry, construction, sculpture, and applied mechanics.

This vast elliptical building, with a spherical roof of glass, has not yet been opened: it has been built by the commissioners of the Exhibition of 1851, out of a portion of the proceeds of that exhibition. It will assuredly be one of the most striking architectural objects in London, and will be one more of the scientific institutions containing collections, which the studious visitor from Canada will earnestly desire to examine.

Altogether it will be seen that at the present time there are very many appliances by means of which science in all its branches, especially natural science, can be thoroughly illustrated and made intelligible and interesting to every inquiring mind. If the communities of English-speaking countries do not steadily advance in their acquaintance with the facts and laws exhibited in Natural Science, it will be very surprising. Still no doubt patience will be required. Where the so-called masses have been for centuries neglected, as, for example, in Southern Britain, where, astounding to narrate, a comprehensive scheme for elementary popular education did not exist until last year, several decades must pass before the laws, the beneficent laws of Nature are known and consciously obeyed among the classes at the base of the social fabric. It will be a happy state of things when throughout a community

from its apex to its lowermost stratum each successive generation, by availing itself of the facilities conveniently placed within its reach, at an early moment possesses itself of the acquisitions of its predecessors, thus securing leisure to itself for new enquiries, having in view the extension of the domain of practical science.

The world stands amazed at the rapid progress made in civilization and material improvement by the colonies planted in Australia, New Zealand, British Columbia, Canada and the continent of America generally. That rapid progress is due to the fact that the colonists, settling in those regions, started from the point which the old communities from whence they issued had attained in science and civilization. They carried with them the results and experiences which had accumulated in the course of past human history. Had it been required of our colonists that they, like their remote fathers, should pass literally through a flint era, a bone era, a bronze era, an iron era, the continents of America and Australia, the islands of New Zealand, Van Dieman's Land, and a score more places that might be named, scattered over the surface of the globe, would not be presenting at this day the scenes which they now do present—scenes which, for evidences of human culture, industry, taste and art, begin to rival those which, a few years since, were supposed to be the special characteristics only of lands whose annals reach back centuries in the past.

Now, each successive generation of men should enjoy a privilege analogous to that which the colonists of Great Britain have enjoyed. Each generation should start on its career, consciously equipped with the practical science which has accrued up to the moment of its setting out.

And in a similar manner, should not each individual youth in a modern community start in his career with a like outfit? Ought not Education to mean this—the indoctrination of each successive crop of youth with at least the elementary principles of all contemporary ascertained human knowledge, with a view to practical purpose in subsequent life? Would not Education, if it signified this, and was this, be the means of saving a great number of human beings from a great deal of blind, aimless action, and from a great number of blunders and mistakes, and so be the means also of economising a great deal of the world's precious time? Should not each generation of our youth be as a colony swarming off from an old, well-constituted and wise state, carrying with it, in germ at least, the knowledge and experience of the

parent community, and starting from the point to which that had managed to attain? Especially in respect to the subjects to which in this address particular reference has been made—the subjects commonly embraced under the term Natural Science—should not an adequate indoctrination of the young be secured?

It is one of the chief distinctions of the era in which we live, that Nature has been, to an extraordinary extent, interpreted—not interpreted fully: work in that direction remains to be done in the generations that will succeed us—but interpreted in very many respects; and so interpreted as to make clear certain consequent duties on the part of man, as well as certain practical advantages to be enjoyed by man in virtue of an acquaintance with that interpretation.

It is discovered, and is universally confessed, that throughout Nature laws reign. These laws does not every sane man confess to be laws of God? It becomes then even a matter of religious obligation to inculcate a knowledge of those laws so far as is practicable and suitable in the education of the young, independently of expediency; independently of the efficiency, personal happiness and economy which accrue when a man's line of action is habitually in the line of those laws; and of the failure, personal misery and waste which are inevitable when his line of action is habitually athwart the line of those laws.

To come back again then to the particular thesis with which this address has been occupied in the main, the place and function of museums and other classified collections in a system of education, popular or abstruse, are clearly seen. The admirable order which objects, simple and complex, raw and wrought up, are therein made to take, even to the eye, impresses in a powerful manner the reign of law in Nature; and they enable the student of Nature, professional or amateur, to make, with immense convenience and great rapidity, personal examinations advantageous to his own enlightenment and advancement in knowledge and skill, which would otherwise be all but impossible for him to make.

I have offered the advice that our youth, who at school or college have received instruction in the first principles of Natural Science, should make a specific use of the great Collections which in so many quarters they will discover in their tour in Great Britain and on the continent of Europe. I have advised that a scheme or plan should be beforehand decided on, to be closely followed during the days or hours which they are able to devote to such collections.

Visits to Boston, Philadelphia and Washington might in like manner be utilized.

The Geological Museum at Montreal should be deliberately and minutely examined Laval, at Quebec, also contains scientific treasures.

Our own University Museum at Toronto is of course familiar ground already to our young lovers of Natural Science. It will be found a good antepast to the feasts that await them on their visits to larger establishments. It presents some good studies in ornithology and entomology. I wish our own small Museum, connected with the Canadian Institute, were richer in objects, but it is not wholly to be despised. The formation of a "Provincial Museum" was one of the objects to be promoted by the establishment of the Canadian Institute. The first section of our constitution reads as follows:—"The Canadian Institute has been established by Royal Charter, for the purpose of promoting the Physical Sciences, for encouraging and advancing the Industrial Arts and Manufactures, &c., effecting the formation of a Provincial Museum, and for the purpose of facilitating the acquirement and the dissemination of knowledge connected with the surveying, engineering and architectural professions."

When an institution like the University of Toronto establishes a Scientific Museum on a good scale by the side of an humble collection like that which the Canadian Institute, with only limited resources, has been enabled to make, the latter necessarily becomes somewhat insignificant. Nevertheless there is a field which our Museum might occupy. It might be made a repository of Canadian archæological and historical objects. The collections in the Normal School buildings, Toronto, exist expressly for educational purposes, and repay a studious examination. Barnett's Museum, at the Falls of Niagara, is by no means a common-place repository of objects. Some very fine genuine Egyptian mummies may be seen there. Our annual Provincial Exhibitions might also be utilized by a student visiting them with definite intention and purpose.

Now, I desire it to be observed, that in all that I have thus far said, I have not supposed for a moment, that Natural Science is to be the sole subject-matter of instruction or study in a system of Education. I have only been insisting that in a system of Education adapted to modern men, Natural Science must have its due place.

I think morals and religion are legitimate developments of man's being, and are subject to Divine law. I believe therefore that these

ought to be included amongst the matters with which Education, somewhere or other in its programme, concerns itself. I think History and the wise and beautiful Thoughts of men in all ages should be subjects of study in a system of Education. Have we not a hint of this in the fact that the written Records which we accept as Holy Writ, as a Divine Revelation, consist of History—of Thoughts exalted, nay, inspired?

I do not dream that Language is to be abandoned in a system of education. That too is now seen to be a human development subject to natural law, *i.e.*, Divine law. It must continue therefore to be a study as it has been in times past, but now a more intelligent study than formerly, as being a positive science, far-reaching, wide-spreading. It will even possibly still hold its own as one of the chief instruments in the training of the very young, for is there not by a Divine arrangement a special aptitude in every infant mind for language? What is more marvellous than the mastery which a little child acquires over its native tongue or any tongue which it hears familiarly spoken?

The laws of mind too, being really laws, Divine laws, brought out into view by a comparison of human experiences, must continue to be taken up, in their elements, in every complete course of education.

But what we inculcate is this, that in addition to all these subjects, at the present time it is expedient, it is reasonable, it is devout, to assign a high place in schools to the knowledge which will help a youth from the very beginning of his career to a true view of the Earth on which he lives, of its constituent parts, of its relations as a member of the Universe. It is expedient, it is reasonable, it is devout, to assign a high place in education to the knowledge which from the beginning of his career will help a youth to soundness and suppleness of body and mind; which, throughout life, will render him, consciously, an interested and skilled worker in his place in the great Whole; and as such, a happy man, going on his way rejoicing, singing and making melody in his heart.

ON THE DIURNAL AND ANNUAL VARIATIONS OF TEMPERATURE AT HALIFAX, NOVA SCOTIA.

BY G. T. KINGSTON, M.A.,

Director of the Magnetic Observatory, Toronto.

FROM BI-HOURLY OBSERVATIONS BY F. ALLISON, M.A., DURING THE THREE YEARS 1867-69.

For developing the climatology of this country, two or more chief stations in each province are needed, differing from ordinary stations, partly in the extent of their instrumental appliances, and partly in the frequency of the observations.

One of the leading objects of these chief stations has been carried out by Mr. Allison, of Halifax, by making the observations from which the results given in this paper are derived. The nature and purpose of these results will be understood from the following considerations.

The majority of observers, being engaged in their various callings, cannot usually observe often enough in the day, nor persevere for a sufficient number of years for the collection of materials adequate for the calculation of the normal values of the elements proper to their several stations.

Their observations can however to a great extent be made comparable with those carried on more frequently, and extended through a long term of years, by applying corrections deduced from the observations made at a few well equipped chief stations and continued through a long series of years, during a portion of which the observations have been taken at *equal* intervals not exceeding three hours.

The corrections are of two kinds. First, the corrections by which compensation is made for the insufficient *frequency* of the observations at ordinary stations; and, secondly, those which compensate their

insufficient *continuance*. It is with the former class of corrections that this article is concerned.

Mr. Allison has forwarded to Toronto for reduction a series of thermometric readings, made by him or under his direction at every even hour (with a very few exceptions) during the three years 1867–69.

In a few instances, when readings at 2 a.m. and 4 a.m. were not taken, the observations of the whole day were set aside. As these, *including Sundays*, were only 22, the unbroken days in the three years amounted to 1,074, and the readings employed in the calculation 12,888; giving, for each month, 80 or 90 readings for each of the twelve bi-hourly means.

The primary object of the computation being to learn for each month the quantity by which the temperature at each hour differs from the mean temperature of the month for all hours collectively, interpolating formulæ for each month have been constructed, by aid of which the most probable temperature could be computed for any instant in the twenty-four hours.

The following is the general type of the formulæ, where T_n represents the required temperature at any time (n) reckoned from midnight, the unit of time being one hour, t , t_1, t_2, &c., certain constant temperatures, and c_1, c_2, &c., certain constant angles derived from the twelve bi-hourly mean temperatures for the particular month under consideration.

$$T_n = t_0 + t_1 \sin(n \times 15^\circ + c_1) + t_2 \sin(2n \times 15^\circ + c_2) + t_3 \sin(3n \times 15^\circ + c_3)$$
$$+ t_4 \sin(4n \times 15^\circ + c_4) + t_5 \sin(5n \times 15^\circ + c_5) + t_6 \sin(6n \times 15^\circ + c_6)$$

The values of the constants t_0, t_1, &c., c_1, c_2, &c., are given for each month in the following table.

TABLE I.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
t_0	19.83	23.18	27.13	37 20	48.15	58.52	64.35	64.13	58.19	46.01	36.02	25.21
t_1	3.33	4.55	6.11	6.86	7.81	8.42	8.64	8.18	6.87	5.58	2.77	2.64
t_2	1.32	1.37	1.72	1.35	1.13	0.66	0.99	1.35	1.81	1.78	1.25	1.08
t_3	0.32	0.25	0.12	0.36	0.60	0.78	0.78	0.74	0.42	0.07	0.20	0.36
t_4	0.15	0.16	0.23	0.02	0.17	0.39	0.21	0.21	0.28	0.22	0.04	0.08
t_5	0.15	0.13	0.11	0.14	0.21	0.07	0.10	0.13	0.14	0.30	0.17	0.07
t_6	0.02	0.02	0.08	0.02	0.03	0.06	0.06	0.01	0.10	0.03	0.02	0.06

TABLE I.—(*Continued.*)

c_1	221° 03′	225° 59′	233° 03′	237° 34′	242° 33′	240° 14′	238° 41′	240° 39′	241° 46′	239° 32′	235° 16′	240° 42′
c_2	60 32	52 43	72 43	67 48	83 23	77 40	69 55	68 21	64 26	71 58	72 17	59 51
c_3	204	191	24	84	54	54	60	54	76	333	261	224
c_4	101	210	182	153	123	99	127	183	225	243	104	97
c_5	32	23	75	164	275	286	276	129	0	17	33	16
c_6	270	270	90	270	270	270	270	90	90	90	270	270

Taking each monthly formula separately, and giving to n successively the values 0, 1, 2, 3, &c., we obtain for that month the mean normal temperatnres for each of the twenty-four hours, as far as the normals can be procured from the observations of only three years.

The results are given in the following table, in which the numbers in the final column for the year are the arithmetic means from the corresponding twelve monthly numbers.

TABLE II.

Monthly Mean Normal Temperatures, at Halifax, for each of the twenty-four hours, from Bi-hourly Observations in the three years 1867–69.

Hour.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midn.	18.83	20.90	24.12	33.05	42.73	52.75	58.79	58.97	54.07	42.78	34.85	23.63	38.79
1a.m.	18.24	20.32	23.11	32.15	42.11	51.92	57.78	58.04	53.53	42.51	34.65	23.47	38.15
2 "	17.40	19.74	22.09	31.36	41.44	50.89	56.64	57.13	52.82	41.86	34.14	23.28	37.40
3 "	16.70	19.28	21.55	30.85	40.73	50.06	55.88	56.63	52.27	41.16	33.59	23.06	36.81
4 "	16.49	19.09	21.39	30.70	40.49	50.15	55.96	56.61	52.04	40.83	33.34	23.05	36.68
5 "	16.63	19.12	21.35	31.06	41.33	51.51	57.01	57.09	52.21	40.97	33.38	23.27	37.08
6 "	16.72	19.23	21.64	32.12	43.26	53.69	58.77	58.32	53.06	41.49	33.48	23.45	37.94
7 "	16.75	19.58	22.83	33.94	45.71	56.08	61.03	60.57	54.79	42.52	33.70	23.52	39.25
8 "	17.20	20.54	24.98	36.24	48.21	58.46	63.78	63.61	57.21	44.36	34.45	23.88	41.08
9 "	18.47	20.26	27.65	38.58	50.66	60.93	66.72	66.70	59.85	46.94	35.90	24.91	43.30
10 "	20.39	24.30	30.24	40.59	53.02	63.30	69.23	69.17	62.30	49.56	37.60	26.38	45.50
11 "	22.07	26.09	32.30	42.77	54.95	65.14	70.90	70.78	64.21	51.42	38.91	27.74	47.27
Noon.	23.38	27.44	33.57	43.83	56.04	66.23	71.99	71.83	65.36	52.29	39.61	28.70	48.36
1p.m.	24.16	28.44	34.10	44.91	56.24	66.65	72.81	72.54	65.92	52.62	39.86	29.17	48.95
2 "	24.38	29.03	34.15	45.19	55.96	66.66	73.30	72.88	66.22	52.77	39.73	29.04	49.11
3 "	23.96	28.90	33.75	44.57	55.55	66.49	73.17	72.65	66.06	52.35	39.13	28.28	48.74
4 "	23.01	27.90	32.68	43.31	54.87	66.08	72.33	71.65	64.78	50.88	38.11	27.19	47.73
5 "	21.88	26.35	30.97	41.73	53.46	65.04	70.81	69.84	62.27	48.65	37.03	26.17	46.18
6 "	20.98	24.83	29.15	39.84	51.14	62.95	68.53	67.37	59.48	46.69	36.29	25.38	44.39
7 "	20.37	23.74	27.67	37.76	48.49	59.98	65.66	64.63	57.44	45.65	35.92	24.81	42.68
8 "	19.95	23.09	26.52	35.93	46.38	57.08	62.89	62.19	56.22	45.10	35.64	24.45	42.29
9 "	19.60	22.60	25.61	34.80	45.10	55.07	60.96	60.57	55.37	44.37	35.30	24.27	40.30
10 "	19.34	22.07	25.03	34.24	44.26	53.99	60.00	59.87	54.72	43.51	34.99	24.10	39.68
11 "	19.13	21.48	24.68	33.32	43.47	53.38	59.45	59.52	54.36	42.95	34.86	23.85	39.20
Mean	19.83	23.18	27.13	37.20	48.15	58.52	64.35	64.13	58.19	46.01	36.02	25.21	42.33

If the difference of each hourly normal in excess or defect from the means for twenty-four hours given at the foot of each column be taken, we have the diurnal variations given in Table III.

TABLE III.

Mean Diurnal Variations of Temperature, at Halifax, for each month and for the year, from Bi-hourly Observations in the years 1867–69.

Hour.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midn.	−1.00	−2.28	−3.01	−5.15	−5.42	−5.77	−5.56	−5.16	−4.12	−3.23	−1.17	−1.58	−3.54
1a.m.	−1.59	−2.86	−4.02	−5.05	−6.04	−6.60	−6.57	−6.09	−4.66	−3.50	−1.37	−1.74	−4.18
2 "	−2.43	−3.44	−5.04	−5.84	−6.71	−7.63	−7.71	−7.00	−5.37	−4.15	−1.88	−1.93	−4.93
3 "	−3.13	−3.90	−5.58	−6.35	−7.42	−8.46	−8.47	−7.50	−5.92	−4.85	−2.43	−2.15	−5.52
4 "	−3.34	−4.09	−5.74	−6.50	−7.66	−8.37	−8.39	−7.52	−6.15	−5.18	−2.68	−2.16	−5.65
5 "	−3.20	−4.06	−5.78	−6.14	−6.82	−7.01	−7.34	−7.04	−5.98	−5.04	−2.64	−1.94	−5.25
6 "	−3.11	−3.95	−5.49	−5.08	−4.89	−4.83	−5.58	−5.81	−5.13	−4.52	−2.54	−1.76	−4.39
7 "	−3.08	−3.60	−4.30	−3.26	−2.44	−2.44	−3.32	−3.56	−3.40	−3.49	−2.32	−1.69	−3.08
8 "	−2.63	−2.64	−2.15	−0.96	+0.06	−0.06	−0.57	−0.52	−0.98	−1.65	−1.57	−1.33	−1.25
9 "	−1.36	−0.92	+0.52	+1.38	+2.51	+2.41	+2.37	+2.57	+1.66	+0.93	−0.12	−0.30	+0.97
10 "	+0.47	+1.12	+3.11	+3.39	+4.87	+4.78	+4.88	+5.04	+4.11	+3.55	+1.58	+1.17	+3.17
11 "	+2.24	+2.91	+5.17	+5.57	+6.80	+6.62	+6.55	+6.65	+6.02	+5.44	+2.89	+2.53	+4.94
Noon.	+3.55	+4.26	+6.44	+6.63	+7.89	+7.71	+7.64	+7.70	+7.17	+6.28	+3.59	+3.49	+6.03
1p.m.	+4.33	+5.26	+6.97	+7.71	+8.09	+8.13	+8.46	+8.41	+7.73	+6.61	+3.84	+3.96	+6.62
2 "	+4.55	+5.85	+7.02	+7.99	+7.81	+8.14	+8.95	+8.75	+8.03	+6.76	+3.71	+3.83	+6.78
3 "	+4.13	+5.72	+6.62	+7.37	+7.40	+7.97	+8.82	+8.52	+7.87	+6.34	+3.11	+3.07	+6.41
4 "	+3.18	+4.72	+5.55	+6.11	+6.72	+7.56	+7.98	+7.52	+6.59	+4.87	+2.09	+1.98	+5.40
5 "	+2.05	+3.17	+3.84	+4.53	+5.31	+6.52	+6.46	+5.71	+4.08	+2.64	+1.01	+0.96	+3.85
6 "	+1.15	+1.65	+2.02	+2.64	+2.99	+4.43	+4.18	+3.24	+1.29	+0.68	+0.27	+0.17	+2.06
7 "	+0.54	+0.56	+0.54	+0.56	+0.34	+1.46	+1.31	+0.50	−0.75	−0.36	−0.10	−0.40	+0.35
8 "	+0.12	−0.09	−0.60	−1.27	−1.77	−1.44	−1.46	−1.94	−1.97	−0.91	−0.38	−0.76	−1.04
9 "	−0.23	−0.58	−1.52	−2.40	−3.05	−3.45	−3.39	−3.56	−2.82	−1.64	−0.72	−0.94	−2.03
10 "	−0.49	−1.11	−2.10	−2.96	−3.89	−4.53	−4.35	−4.26	−3.47	−2.50	−1.03	−1.11	−2.65
11 "	−0.70	−1.70	−2.45	−3.88	−4.68	−5.14	−4.90	−4.61	−3.83	−3.06	−1.16	−1.36	−3.13

One of the uses of Table III. is to supply corrections to the monthly means derived from less frequent observations at the *same station* in other years, so as to render them comparable with the means derived from an hourly or bi-hourly series.

This has been done in the case of the temperatures at Halifax in 1870, when the observations were taken at equal intervals of four hours, commencing at 4 a.m. The corrections (which are very small) were applied to the monthly means for 1870, and the corrected means were then combined with the monthly means for the years 1867, 1868, and 1869, as shown in the following table.

	Jan.	Feb.	Mar.	Apr.	May.	June.
1870, uncorrected	29.48	23.79	28.53	40.79	46.39	59.18
Corrections for Diurnal Variation	+0.02	+0.02	−0.08	+0.02	+0.03	+0.06
1870, corrected for Diurnal Variation	29.50	23.81	28.45	40.81	46.42	59.24
1867—1870	22.24	23.34	27.46	38.10	47.72	58.70

	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1870, uncorrected	64.56	64.27	56.54	48.15	38.92	30.78	44.28
Corrections for Diurnal Variation	+0.06	−0.01	−0.09	−0.03	+0.02	+0.06	+0.01
1870, corrected for Diurnal Variation	64.62	64.26	56.45	48.12	38.94	30.84	44.29
1867—1870	64.42	64.16	57.76	46.54	36.75	26.61	42.82

An interpolating formula being constructed from the twelve monthly means in the lowest line, on the assumption that they are the temperatures proper to the *middle days* of the several months; if the coefficients calculated on this erroneous assumption be multiplied respectively by the following factors, the expression given below is obtained, in which T_n denotes the daily mean temperature at any time n, reckoned from January 15, the unit of time being the twelfth part of the year.

$$\frac{\frac{\Pi}{12}}{\sin\frac{\Pi}{12}}\,;\qquad \frac{2\,\frac{\Pi}{12}}{\sin\frac{2\,\Pi}{12}}\,;\quad \&c.\qquad \frac{6\,\frac{\Pi}{12}}{\sin 6\,\frac{\Pi}{12}}\,;$$

$$\begin{aligned} T_n = {} & 42^\circ.82 + 21^\circ.82 \sin (n \times 30^\circ + 256^\circ.48) + 0^\circ.77 \sin (2n \times 30^\circ + 55^\circ) \\ & + 0^\circ.18 \sin (3n \times 30^\circ + 252^\circ) + 0^\circ.25 \sin (4n \times 30^\circ) \\ & + 0^\circ.89 \sin (5n \times 30^\circ + 5^\circ) + 0^\circ.14 \sin (6n \times 30^\circ + 270^\circ) \end{aligned}$$

From the preceding equation which, by giving suitable values to (n), expresses the *normal* daily mean temperature at Halifax on every day in the year, the mean temperatures of the warmest and coldest days are found, together with the days of their occurrence, and the days on which the daily mean passes through its mean annual value.

Warmest day, August 28. Mean temperature, 64°.90.

Coldest day, January 13, 14. Mean temperature, 21°.95.

In Spring, the mean of the day is below the mean of the year on April 29, and exceeds it on April 30.

In Autumn, the mean of the day passes through its annual value between October 25 and October 26.

TABLE IV.

Combination.	Jan.	Feb.	Mar.	Apr.	May.	June.
Arithmetic Means from 7, 2, 9	+0.41	+0.56	+0.49	+0.78	+0.77	+0.75
7, 2, 9, 9	+0.25	+0.27	—0.08	—0.02	—0.18	—0.30
6, 2, 10	+0.32	+0.26	—0.19	—0.02	—0.32	—0.41

Combination.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Arithmetic Means from 7, 2, 9	+0.75	+0.54	+0.60	+0.54	+0.22	+0.40	+0.56
7, 2, 9, 9	—0.29	—0.48	—0.25	—0.00	—0.01	+0.06	—0.09
6, 2, 10	—0.33	—0.44	—0.19	—0.09	+0.05	+0.32	—0.09

In Table IV are shown the errors in the approximate monthly means when the daily mean is considered as the simple arithmetic means of the temperatures observed at 7 a.m., 2 p.m. and 9 p.m., and of those observed at 6 a.m., 2 p.m. and 10 p.m.; and also when the daily mean is taken as equal to the *fourth* part of the sum of the temperatures at 7 a.m., 2 p.m., and *twice* the temperature at 9 p.m.

It is seen that the arithmetic mean of observations at 7 a.m., 2 p.m. and 9 p.m., gives a result too high by 0.° 56 on the average of all months, and nearly eight-tenths too high from April to July.

The arithmetic mean of observations at 6 a.m., 2 p.m. and 10 p.m., is in no case more than half a degree in error; it is too high from November to February, and too low during the rest of the year, the average error irrespective of sign being a quarter of a degree, and the error in the annual mean less than one-tenth in defect.

When the observation at 9 p.m. is reckoned *twice*, the greatest error which occurs in any month is slightly greater, but the average error of the twelve monthly means, the signs of the errors being disregarded, is 0.° 18, and the error in the annual mean the same as in the preceding case.

These results accord in their general character with the experience of other places at which the observations have been sufficiently frequent for determining the diurnal variations.

As regards suitability for yielding daily means, 7, 2, 9, 9, and 6, 2, 10, may be regarded as of nearly equal merit; and as 7, 2, 9, are in many respects more convenient to observers than the other combination, and less liable therefore to interruptions, these hours are recommended to those observers in Canada who read their instruments three times each day.*

The numbers in Table III, as the title states, are the *monthly means* of the diurnal variations, and are only adapted therefore for the reduction of *monthly* means at single hours to monthly means for all hours, and for the converse reduction. Comparison of like hours in contiguous months will show a considerable difference in the analogous variations. To correct *daily* means, therefore, it is necessary to possess tables in which diurnal variations are given at much shorter intervals. As three years is scarcely sufficient for the elimination of accidental irregularities, the computation of the diurnal variations for every fifth day

* 7 a.m., 2 p.m. and 9 p.m., have been adopted for many years by the Smithsonian Institution.

has been postponed till at least two more years have been added to the series. For a like reason, the discussion of questions relating to the comparative variability of different months, and of daily means at different parts of the year, has not been undertaken. The collection of suitable materials for Halifax is however in progress, as Mr. Allison has been observing at equal intervals of three hours since the beginning of 1871.

It was stated at the commencement of this article, that besides the corrections for diurnal variations, or those needed to compensate for the insufficient *frequency* of the observations, corrections are also required in order that observations taken during a few years may be rendered comparable with those continued during a long series of years.

In procuring data for the second class of corrections some other observers have made considerable progress; but in order to give full effect to their past work, it is requisite that they should undertake for a few years at least equidistant-observations at intervals not exceeding three hours. Among these, Mr. Murdoch, C. E., of St. John's, New Brunswick, who has been actively engaged in Meteorology for more than ten years, is about, it is believed, to commence a system of three-hour intervals. Should he persevere in this undertaking for four or five years, his series will be inferior to that of no station now in correspondence with Toronto.

It is much to be desired also that a three-hour system could be established under Dr. Smallwood, at Montreal, and Capt. Ashe, at Quebec, in order that their observations in past years may be more effectively utilized.

In connection with the subject of diurnal variations it is satisfactory to mention that, through the kindness of the Rev. Dr. Fyfe, President of the Canadian Literary Institute, the Baptist College at Woodstock, Ontario, Mr. Montgomery, the mathematical tutor, with other officers of the establishment, have been engaged for some months in taking observations of the temperature, day and night, at equal intervals of three hours. Mr. Montgomery is fully alive to the importance of accuracy; and as his arrangements are very excellent, it is anticipated that valuable aid will be supplied by his labours towards the reduction of observations in other parts of West Ontario.

THE PHARAOH OF THE EXODUS IDENTIFIED IN THE MYTH OF ADONIS.

BY THE REV. J. CAMPBELL, M.A.

Read before the Canadian Institute, March 11th, 1871.

The title of this paper plainly proclaims its writer a student of that old and much abused school of mythology, which Euhemerus is supposed to have founded more than two thousand years ago. I am convinced, with this ancient, that the gods and heroes, about whose descents and deeds mythology is concerned, were neither the creatures of fancy nor personifications of moral qualities and natural phenomena, but real men and women, who once played their parts upon the world's stage, and who, for the good or evil in them, were deified by their subject contemporaries or by their descendants. I am not disposed altogether to discard the *ethical* and *physical* solutions, of which Prof. Max Müller speaks in the second series of his Lectures on the Science of Language,[1] nor his own *philological* solution of the question, "Whence came myths?" It seems abundantly evident that many old classical tales were put into the shape in which they have come down to us by men who desired to point a moral; that some were made vehicles to convey astronomical and other physical truths; and that corruptions or changes of language facilitated the growth of not a few, as Bochart attempted to show in the case of equivoques between the Greek and Phœnician languages.[2] But I hold, and believe that, as I prosecute my studies in this department of literature, I shall be compelled still more firmly to hold, that the *historical solution*, however much it may have been abused by great men, such as Vossius,[3] Bochart, Huet,[4] Banier[5] and Bryant,[6] is the only one that solves the *ultima ratio* of Mythology, and leaves no residuum of miraculous inventive power on the part of the ancients to be accounted for otherwise. While I rejoice in the testi-

[1] Lectures on the Science of Language, Second Series, lecture ix.
[2] Bochart, Phaleg. L. i, c. 1.; Canaan, L. i, c. 28.; 1692.
[3] Vossius, G. J. de origine ac progressu idololatriae, 1641.
[4] Huet, P. Dan. Demonstratio Evangelica, 1680.
[5] Banier, Ant. La mythologie et les fables expliquees par l'histoire, 1728.
[6] Bryant, James, New System, or an Analysis of Ancient Mythology, 1773.

mony given by the Apologist Fathers of the Christian Church[7] in favour of a doctrine that received support from such enlightened heathens as Hecataeus of Abdera,[8] Diodorus Siculus[9] and Cicero;[10] in the adhesion to it of many of the greatest divines of France, Catholic and Reformed;[11] and in the countenance afforded by the Christian philosopher, Sir Isaac Newton,[12] together with some of the brightest lights in the Church of England:[13] I am very far from supposing, with certain of them, that the stories of antiquity are mere corruptions of parts of the Sacred Narrative. Still less would I be disposed to accept Mr. Gladstone's remarkable theory, that Mythology is a poetical exhibition of the truths of Divine Revelation.[14]

My position is simply this. The Old Testament contains a record of events which, from their connection with civilized nations, deserve to be called historical, as distinguished from others that happened to individuals and obscure tribes; such I conceive to have been the destruction of the cities of the Plain and the exodus of the Israelites from Egypt. The truthful nature of the record, in regard to later historical events, is attested by existing monuments and by profane historians, in whose general veracity the scientific world is pretty well agreed. We have reason, therefore, to believe that the earlier events recorded have an equal basis of truth; and that, if profane records existed of what occurred at the same time and in the same neighbourhood, confirmation would not be lacking in their case. In regard to time, we cannot complain of the Greek historians: some of these go far enough back into the past to satisfy the zeal for antiquity of the late Baron Bunsen. Neither do we find any difficulty in regard to place: Syria, Phœnicia, Arabia, Egypt, Ethiopia and Libya are well described, and the history of many of these countries given at length. But, restricting ourselves to the limits which both of these elements (time and place) impose upon our research, we find nothing that is generally received as historical: all is mythology! Shall we at once conclude that search is hopeless, in view of what certain superstitious Greeks and fanciful

[7] Tertullian, Clement of Alexandria, Origen, Minucius Felix, Lactantius, Arnobius, Eusebius, Augustine, all favoured the system of Euhemerus, and argued upon it as a basis against Paganism.

[8] Ap. Eusebii, Praep. Evangel. L. iii, et ap. Clem. Alex. Stromata, v.

[9] Bibliotheca Historica, L. i, c. 7, L. iii, c. 29; Frag. ap. Euseb. Prep. Ev. L. ii.

[10] De Natura Deorum, Lib. iii.

[11] As Bossuet, Banier, Huet, Thomassin, Tournemine, Bochart, Le Clerc.

[12] The Chronology of Ancient Kingdoms Amended.

[13] Usher, Stillingfleet, Cumberland, Shuckford, &c.

[14] Homer and the Homeric Age. Juventus Mundi.

Germans have said concerning myths; or shall we, emboldened by the example of many great men and true scholars in the past, and undeterred by their partial failure, give the myth another opportunity of proving itself to be history in disguise? My practical answer to this question has been an enquiry into the mythology, not only of ancient Greece and Rome, but of India, Persia, Arabia, Egypt, and even of the Germanic and Celtic races; the end of which, I trust, may be the formation of a System of Comparative Mythology, that will furnish us with the history of a period too long regarded as pre-historic.

Among the many myths that have occupied my attention of late, and for which I profess to have found solutions, I have chosen for the subject of my first paper that of ADONIS; the principal reason for this choice being that the story itself, and the historical narrative with which it is compared, are within the reach of every intelligent reader. In the case of identity which it will be my aim to prove, I might make my proof much stronger by means of connections furnished in Hindoo mythology and Persian mythical history; but, as these connections are only confirmatory, and not essential to the argument, I prefer to restrict myself mainly to what is said on Egyptian monuments and by Greek writers, bearing upon the two characters that are to be reduced to unity.

The scene of the story of Adonis is laid either in Cyprus, or near Byblus in Phœnicia, and it formed the subject of an annual ceremony observed in almost every Grecian city of any importance. The story of the Exodus, on the other hand, belongs almost entirely to Egypt, only connecting in a very secondary way with Arabia Petraea and Palestine. That the story of Adonis came from the East there can be no doubt. The very name Adonis, as the Hebrew *Adonai* (Lord), sufficiently indicates its Syrian or Phœnician origin. Since we have thus a clear case of the transportation of a well-known story and an all but universal rite from an oriental and *so-called* Semitic region into the midst of a *so-called* thoroughly Indo-European population, why may we not, after examining more closely into rite and story, find them exotic even in Asiatic Phœnicia, and discover their original habitat among the *so-called*[15] Hamites of the world's cradle, African Egypt. There is no

[15] I use the word *so-called* in the above triple connection because I can find no evidence that the Phœnicians were originally in any appreciable degree a Semitic people, the rulers of Egypt a Hamitic stock at all, or the Greeks (a very mixed race) free from admixture of both these elements with their Aryan base. To ignore Syria, Palestine and Egypt, in connection with the spread of the Aryans and their civilization, is to shut the eyes wilfully to evidence monumental,

reason why the story should not be traced beyond Phœnicia and to Egypt, if proof can be given of the connection by migration or commercial and literary intercourse of Egypt, Phœnicia and Greece. This I shall endeavour to give, first of all. My three propositions will thus be the following:

1. That Egypt, Phœnicia and Greece were most intimately connected in various ways from very ancient times.

2. That Acencheres Mesphres Thothmosis was the Pharaoh of the Exodus, and that in his reign this intimate connection existed.

3. That the circumstances connected with the death of the Pharaoh of the Exodus, his names and parentage, clearly point him out as the Adonis of Phœnicia and Greece.

I.—EGYPT, PHŒNICIA AND GREECE WERE MOST INTIMATELY CONNECTED IN VARIOUS WAYS FROM VERY ANCIENT TIMES.

Greece and Eyypt.—In taking up the direct connections between Egypt and Greece, the difficulty, with any attentive reader of the Greek historians, is one of selection,—so numerous are the links with which they bind the two countries together. Herodotus plainly states that the gods of Greece, originally Egyptian, were introduced by the Pelasgi,[16] and Diodorus says much the same regarding their origin.[17] These statements have been confirmed by the researches of Creuzer,[18] Guigniaut,[19] and many other students of mythology in recent times. Herodotus, Theopompus, Apollodorus, Diodorus Siculus, Pausanias, with a crowd of other writers, including many poets and the dramatists, agree in drawing a large number of the heroes and great families of mythical Greek history from Egypt. Thus Ogyges founds Egyptian Thebes, and gives his name to the whole country;[20] Peloponnesus is called the Apian land after Pelops, who is the Egyptian Apis;[21] and Actis, head of the Rhodian line, founds Heliopolis.[22] Not only is

traditional, geographical and philological, that has been accumulating for ages. Nothing can be more certain than that the whole sea-coast of the Mediterranean, north, south and east, was held, in Phœnicia, Palestine, Egypt and Libya, equally as in Asia Minor, Greece and Italy, by the family of nations now called Indo-European.

16 Herodot. L. ii, c. 52.

17 Diod. Sic. L. i, c. 7, &c.

18 Creuzer, Symbolik and Mythologie der alten Völker, 1819.

19 Guigniaut, Religions de l'Antiquité, 1825.

20 Guigniaut, vol. iii, p. 88; Banier, vol. iii, p. 33.

21 Pausanias, L. ii; Augustine, Civ. Dei. L. xviii, c. 5.

22 Diod. Sic. L. v, c. 35.

Cecrops brought from Sais,[23] but Erechtheus,[24] Petes, and even Menestheus, his son, who led the Athenians in the Trojan war, are made Egyptians;[25] while Sais, with its tutelary divinity, Neith, is made the abode of the original Athene.[26] The Argive line, commencing with Io, who gives birth in Egypt to Epaphus, a purely Egyptian name,[27] and including Danaus and Aegyptus, Lynceus, and even Perseus, all natives of Chemmis,[28] is thoroughly Egyptian. The people of Laconia and Megaris connect with this ancient land in Lelex.[29] Orpheus and Homer, who make such frequent allusions to Egypt, are said to have learned wisdom on the banks of the Nile,[30] whence came the Orphic mysteries.[31] Many arts and sciences cultivated among the Greeks have the same origin assigned them.[32] From Egypt Herodotus derives the Grecian amour;[33] and the scenes of many well-known fabulous narratives, such as that of Prometheus, are placed in that country.[34]

Greece and Phœnicia.—With Phœnicia we may include the whole sea-coast of Palestine, inhabited by a homogeneous people. At Paltus, we are told, Memnon lies buried.[35] From Sidon, Cadmus carried Phœnician letters to Greece,[36] and there Paris stopped with Helen on their way to Troy from Lacedæmon.[37] In Accho, Herculus was bitten by a serpent.[38] To Dora Mazocchi assigns the origin of the Dorian race.[38*] The great battle of Perseus with the sea monster, almost all geographers are agreed in placing near Joppa.[39] Even Ascalon was founded by a brother of Tantalus, the father of Pelops,[40] although the Lydian narrative ascribes its foundation to a general of Alcimus of Lydia,[41] and the

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[23] Theopompus ap. Euseb. Prep. Ev. L. x, c. 10; Proclus ap. Tim. Plat., Diod. Sic. i, 16; Cedrenus, J. Tzetzes, Suidas, &c.

[24] [25] Diod. Sic. L. i, S. i, c. 16.

[26] Lycophron, v. 3, Schol.; Guigniaut ii, 719, &c.

[27] Herod. ii, 153, iii, 27: "Apis is the god whom the Greeks call Epaphus." Epaphus must connect with Apophis, the type of evil in Egypt, and the name of the Shepherd King, who reigned nearly 100 years.

[28] Herod. ii, 91, vi, 53; Diod. Sic. i, 16, &c.

[29] Pausanias, i, p. 95.

[30] [31] Diod. Sic. L. i, S. ii, c. 36; Herod. ii, 81.

[32] Zonaras, quoted by Bryant in his Analysis, &c., vol. i, p. 22.

[33] Herod. iv, 180.

[34] Diod. Sic. L. i, S. i, c. 9.

[35] Simonides ap. Strab. L. xv, c. 3, ¶ 3.

[36] Euseb. Chronic. ap. Usserii Annal. Vet. Test.; Banier, iii, 71, &c.

[37] Homer's Iliad, vi, 290; Vid. Herodot. ii, 116.

[38] Stephanus Byzant. Ptolemais.

[38*] Anthon's Classical Dictionary Art. Paestum.

[39] Strabo, L. i, c. 2, ¶ 36; Pomp. Mela, L. i, c. 11; Pliny, ix, 5; Solinus, xxxiv, 1.

[40] Steph. Byz. Ascalon.

[41] Xanthus ap. Steph. Byz. Ascalon.

Arabian to a man of Ludim of Amalek.[42] The Bœotian connection with Phœnicia in Cadmus is maintained by the story that Ogyges fled from Phœnicia to Acte, afterwards called Attica.[43] Two Germans—Movers, in his "Phœnicians,"[44] and Hitzig, in his "Philistines"[45]—have done much to show how intimate were the relations subsisting between these two branches of the Phœnician stock on the one hand, and the Greeks on the other. Mr. Gladstone, in his recent work, "Juventus Mundi," dwells largely on the debt which Greece owed to Phœnicia, and on the strong Phœnician domination exerted in Greece from Crete as a centre.[46] Hitzig almost goes so far as to say that Crete colonized Greece with Phœnicians, and Philistia with Pelasgians.[47] My own belief is that the tide of emigration was all in one direction, from south-east to the north and westward, and that Philistia and Phœnicia were stages in the progress of one of the streams that flowed from Egypt to civilize the world. This is the view of Freret and Raoul Rochette, who regard the Hycsos or Phœnician pastors of Egypt as the authors of Greek and Roman civilization.[48]

Egypt and Phœnicia.—In considering the connections of Egypt and Phœnicia with each other, we pass from what historians have been pleased to regard as the untrustworthy accounts of ancient authors, to surer ground in existing monuments. Lenormant and Chevalier, in their valuable Manual of Oriental History,[49] state, from monumental evidence, that the Egyptian empire, at the beginning of the eighteenth dynasty, extended to Phœnicia, and that "the Sidonians, in common with all the neighbouring populations, were subject to the Egyptians, and remained so during the whole period of the eighteenth, nineteenth and twentieth dynasties, from the first half of the seventeenth till the end of the thirteenth century B.C. * * * The hieroglyphic inscriptions frequently speak of the tributes, the arts and the riches of Phœnicia. * * * The Pharaohs of this period have left great steles, commemorative of their supremacy, on the rocks of Nahr-el-Kelb, near Beyrut, and at Adlun, near Tyre. * * * A valuable papyrus, now in the British

[42] Ritter's Comparative Geography of Palestine, iii, 263.

[43] Thallus ap. Theophil. ad Autolyc.

[44] Mövers, die Phœnizier.

[45] Hitzig, Urgeschichte und Mythologie der Philistaer.

[46] Gladstone, Juventus Mundi, p. 121, &c.

[47] Hitzig, die Philistaer, B. i, cc. 2, 3, 4.

[48] Fréret, Recueil de l'Académie des Inscriptions, vol. 47; Raoul Rochette, Histoire de l'établissement des Colonies grecques i, c. 4, p. 60.

[49] A Manual of the Ancient History of the East to the commencement of the Median Wars, translated from the French of F. Lenormant and E. Chevalier: London, 1869-70.

Museum, contains the account of an imaginary journey made into Syria by an Egyptian functionary, at the end of the reign of Rameses II., after the conclusion of the final peace with the Hittites."[50] These and similar facts, the records of which abound upon the walls of Egypt's temples and palaces, abundantly establish the existence of relations of the most intimate kind between the two countries.

In view of the intercourse which thus appears to have been maintained from a very early period between the three peoples—Egyptians, Phœnicians and Greeks—there can be no antecedent improbability in the supposition or assumption that the knowledge of one of the greatest national calamities the world has ever seen, happening to one of them, should be possessed and retained by the others. If, as is not unlikely, the story were imported by emigrants from the land in which the event it described took place, it would be told and handed down in such a way as would naturally give wrong ideas of persons and places. Thus, an Alsatian removing to the German side of the Rhine might entertain his children with stories of "the Emperor" and "his people," by which he would mean Napoleon and the French, and which they would be in danger of interpreting William and the Germans. The Phœnician, midway between the Egyptian and the Greek, presents a somewhat analogous case. We need not then be surprised to find Pharaoh disguised in Phœnician or even in Greek wrappings. These circumstances of time and place have been found to vary so greatly even in regard to modern stories with a well-ascertained historical basis, that the identity of ancient characters and events should no more be measured by them than the personal identity of a man by the cut of his clothes. Considerations such as these, however, come more within the province of my third proposition.

II.—Acencheres Mesphres Thothmosis was the Pharaoh of the Exodus; and in his reign this intimate connection existed.

The Bible is the only ancient record that gives us anything like a straightforward account of the Exodus of Israel from Egypt. We have other partial and disguised narratives from profane writers, in the works of Josephus,[51] and Eusebius.[52] Diodorus Siculus reports a tradition of the Ichthyophagi, to the effect that, on one

[50] Lenormant and Chevalier's Manual, vol. ii, p. 160.
[51] As those of Manetho, Chaeremon and Lysimachus.
[52] As those of Manetho, Artapanus and Polemo.

occasion, the tide of the Red Sea went out so far as to leave dry the part usually covered with green water, but soon returned to its bed.[53] Trogus Pompeius also, the abbreviator of Justin, gives an account of the departure of Moses from Egypt with much stolen property, after which the Egyptians sought to go, but were driven back by a tempest.[54] Tacitus tells the story at greater length, and with greater inaccuracies.[55] It is only in the extracts from Manetho and other Egyptians, contained in Josephus and Eusebius, that we find names given to the Pharoah of the Exodus, from which anything can be deduced by comparison with the Egyptian inscriptions. The book of Exodus is silent in regard to the name of the monarch, although it clearly points him out as the son of the first oppressor of Israel, and apparently the second of a line new to Lower, but not necessarily to Upper Egypt.[56] It also informs us of the names of his treasure cities, which, like the Alexandrias, Ptolemais and Cæsareas of later times, doubtless commemorated himself or some member of his family. These were Pithom and Raamses,[57] the Pi of the former being the Coptic article, and the Thom the name of a God;[58] the latter being identical with the dynastic name Rameses. The name of the god Thom or Thum occurs in the name Thummosis, made the same as Thothmosis by Manetho.[59] Now, no such name as either Thothmosis or Rameses occurs before the so-called[60] 18th dynasty of Manetho; and all the kings bearing these names are found between the 18th and 20th dynasties. The 18th dynasty is not only entirely different in character from that which precedes it, a Shepherd line, but is represented as having erected or at least greatly extended its empire upon the ruins of the Shepherd power. The first of this new race, Amosis, also called Thothmosis and Alisphrag, or Misphrag-muthosis, drove out the Shepherds.[61] After this Amosis, or Ahmes as he is generally called, are

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53 Diod. Sic. L. iii, c. 20.

54 Historiæ Philippicæ, L. xxxvi, c. 2.

55 Tacitus Histor. L. v, c. 2.

56 Exod. i, 8.

57 Exod. i, 11.

58 Lepsius' Letters from Egypt, &c, ; Bohn, p. 448, note.

59 Josephus Cont. Ap. i, sec. 14.

60 There is no foundation, beyond the ingenious result of Manetho's multiplying powers, for anything like this number even of contemporary dynasties. There were no more than three consecutive dynasties in Egypt from the beginning of sovereignty there till the Exodus of Israel, a well marked period, when Proteus or Anarchy arose; the first, of the old Menes or Mencherian line, the second of the so-called Shepherds, and the third, which came of a line that, descending from the first rulers of Egypt, had governed Upper Egypt contemporaneously with the Shepherds, and that had strengthened itself by Assyrian or Asiatic alliances, until it became strong enough to resume the dominion which its ancestors had lost.

61 Josephus Cont. Ap. i, sec. 14, &c.

placed the Thothmoses to the number of four; and the Rameses to the number of fourteen represent the 19th dynasty. My firm conviction is that Thothmosis and Rameses are different names for the same individual. Time will permit me to do little more than to indicate the line of argument which I would pursue in order to justify this statement.

1. Their shields, giving not only the name Thothmosis or Rameses, but also various titles of honour, are found confusedly (if they be different persons) on many buildings, which one or more Thothmoses and many Rameses are together represented as erecting, so that there is hardly a temple of a Thothmosis that a Rameses is not supposed to have finished two hundred years after.[62]

2. They overcame the same enemies in the same localities, and have the same products presented to them as tribute by the same peoples, under precisely similar circumstances.[63]

3. In their family relations, the names of their wives, the gods worshipped by them, and the length of their reigns, as well as in their immediate ancestors, there are great points of resemblance, that might be termed remarkable coincidences, to which the history of other lands and ages affords no parallel.[64]

4. Tacitus ascribes the tablet, expounded by the Egyptian priests in the hearing of Germanicus, to a Rameses;[65] but Osburn and others agree that it is of Thothmosis.[66] This very statistical tablet of Karnak mentions the setting up of a stele in Naharaina, and the form of the stele, as represented in the inscription, exactly corresponds with those cut in the rock at Nahrelkelb bearing the image of Rameses III.[67]

Pliny seems to indicate,[68] and Ammianus Marcellinus plainly states, in his Greek translation of the hieroglyphic inscription,[69] that the obelisk now in the Piazza del Popolo at Rome was erected by a Rameses, while it really bears the name of Thothmosis IV.[70]

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[62] Kenrick's Ancient Egypt under the Pharaohs, ii, 181, 215, 224: De Lanoye's Rameses the Great, translated, New York, 1870, p. 172; Lepsius' Letters from Egypt, 248-9.

[63] Kenrick, ii, 216; also compare 178 and 213. Lenormant and Chevalier, i, 240, &c.; Kenrick, ii, 226; Rawlinson's Herodotus, Appendix, book ii, c. 8, p. 310.

[64] As the female regent that is found with similar relationships in each case; the names common to queens of Thothmoses and Rameses, Ahmes, Nofre Ari and Atari; the gods Ra Thoth, Amun, &c.; the two long reigns of Thothmosis III. and Rameses II.; and the descent of each from Horus.

[65] Tacitus Annales, ii, 60.

[66] Osburn, ii, 453; Kenrick, ii, 192.

[67] Kenrick, ii, 190.

[68] Pliny Hist. Nat. L. xxxvi, c. 13, &c.

[69] Am. Marcell. L. xvii, c. 4.

[70] Sharpe's Early History of Egypt.

5. Herodotus and Diodorus Siculus, who give the history of Egypt from the earliest times, with other writers who treat of ancient Egyptian affairs, know nothing either of the name Thothmosis or of that of Rameses, unless it be in the forms Rhampses and Rhampsinitus, ascribing the deeds of all the Thothmoses and Rameses to two kings both called Sesostris or Sesoois, the first of whom was a great conqueror, and the second an unfortunate Pharaoh, after whose death came Proteus or Anarchy.[71]

6. The Rev. W. B. Galloway, a recent suggestive writer, decides that Amosis, Thothmosis and Rameses are the same, or variations of the same name, produced by the prefixes Ra, the sun, and Thoth, Mercury.[72] An older authority, Mr. Henry Salt, does not scruple to say, "I may remark that one of the most interesting names of kings is that of Rameses Thothmosis, who was nearly contemporary, as the best chronologists agree, with Moses."[73] I observe that Mr. Osburn, in a portion of a recent little work, which must have been under his supervision, permits the omission of all the Thothmoses.[74]

7. An insuperable difficulty in the way of reconciling the Scripture narrative with monumental evidence as it is now taken, has all along been felt to arise from the long period of time by which the supposed two great conquerors and enslavers of the 18th and 19th dynasties were separated. The following statement of M. de Lanoye, in his little book on Rameses the Great, will illustrate this:—"Rameses II. was the persecutor of the Israelite family, whose increasing number became a subject of alarm for his policy. * * We should point out that the cruel policy practised by Rameses towards the Hebrews was not exclusively his own; it had been that of all his predecessors," among whom he specially mentions Thothmosis III.[75] If we are to believe the chronology of M. de Lanoye, which is that now generally received, two centuries at least intervened between these two men, concerning whose cruel treatment of the Israelites many monuments testify. The book of Exodus mentions only two kings in immediate succession, whose joint reigns cannot have amounted at most to one hundred years, as Israel's oppressors. In spite, therefore, of Lepsius' attempted reconciliation,[76]

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[71] Herod. L. ii, cc. 102-112; Diod. Sic. L. i, s. 2, cc. 9-12.

[72] Egypt's Record of Time to the Exodus of Israel, 1869, p. 90.

[73] Essay on Dr. Young and M. Champollion's Phonetic System of Hieroglyphics, &c.; 1825.

[74] Facts and Dates, by Dr. Mackay, 1869, the Introduction to Egyptian Chronology being written by Mr. Osburn.

[75] De Lanoye's Rameses the Great, p. 200.

[76] Lepsius' Letters, 424.

the discrepancy will remain while Thothmosis and Rameses are kept apart. Mr. Osburn, in his Monumental Egypt, seeing this difficulty, draws them much closer together, finding that Thothmosis was a persecutor of Israel equally with Rameses.[77] The first of the two Pharaohs of the book of Exodus must be he of whose reign bricks containing straw are first found, and on whose monuments captives with Israelitish features are represented engaged in brick-making and building. Kenrick,[78] following Rosellini, calls this monarch Thothmosis III; while M. Chabas and Dr. Brugsch, on the authority of two papyri mentioning the Aperiu or Hebrews as this subject people, and of the rock inscription at Hamamat, decide for Rameses II.[79] Admitting the impossibility of Rameses II. coming after the Exodus, if the Scripture narrative be true, I decide for both of these, and, with Mr. Salt, call the Pharaoh Rameses-Thothmosis, who is Sesostris the later, or Sesoois,[80] the conqueror of the Shepherd line, and the father of an effeminate and unfortunate son Sesoois II, Pheron, or Nuncoreus, reported by Herodotus and Diodorus to have impiously shot his arrows against the Nile, and to have become blind in consequence.[81]

Ancient and modern writers upon Egyptian affairs, who have not, like Mr. Salt, cut the gordian knot of the 18th and following dynasties, are divided between the Thothmoses and the Rameses as furnishing from their number the Pharaoh of the Exodus. We may as well discard the numerical designations of the kings of these names, as they may tend to confuse, and as there is not a complete agreement among Egyptologists in the use of them. The cool way in which a few Rameses are thrown in to make up a dynasty is exemplified in Prof. Rawlinson's Manual of Ancient History. After mentioning Rameses VIII, he says, "Six or seven other kings of the same name followed."[82] We shall deal, therefore, only with Thothmoses and Rameses. As my argument hangs principally upon the first of these names, we may consider first the testimonies in favour of the latter.

Manetho, in one place,[83] and Chaeremon,[84] call the Pharaoh in whose

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[77] Osburn's Monumental History of Egypt, vol. ii, 249, 296.

[78] Kenrick, ii, p. 194; see also A Popular Account of the Ancient Egyptians, by Sir J. G. Wilkinson, abridged edition, vol. ii, p. 194.

[79] Chabas, Mélanges Egyptologiques. Brugsch, Aus dem Orient.

[80] It is found that Sesou forms part of the name of Rameses II, although Thothmosis III. and Sesostris are often identified. See De Lanoye's Rameses the Great, Appendix v.

[81] Herod. L. ii c. 3; Diod. Sic. L. 1, s. 2, c. 11.

[82] A Manual of Ancient History, by George Rawlinson, M.A., 1869, p. 69.

[83] Josephus, Cont. Ap. i, 26, 27. [84] Id. i, 32.

reign Israel went out of Egypt, either Sethos, Rameses or Amenophis, it being distinctly stated by them that Sethos and Rameses are names of the same person, as the monuments also testify, and that Amenophis is father or son of a Rameses. Usher[85] favours the idea that a son of Rameses the Great or Sesostris was the drowned monarch; and the majority of later writers, whose opinions are of value, including the Duke of Northumberland,[86] Lepsius,[87] Osburn[88] and Lenormant,[89] give their voice for Seti Menephthah or Merenphtah, who is Chaeremon's Amenophis or Amenophath, the son of the great Rameses.

On the side of a Thothmosis we find Manetho[90] in another place, where he is plainly inconsistent with himself if Thothmosis and Rameses are not the same, Julius Africanus[91] and George Syncellus,[92] and, among the moderns, Sir J. Gardner Wilkinson, almost alone. The view of Sir J. G. Wilkinson, it is but right to state, is the only one that agrees with the Usserian or any other rational chronology of of the Old Testament Scriptures. He says: "The rising of Sothis, in the reign of Tothmes III, now calculated by the learned M. Biot to correspond to between 1464 and 1424 B.C., shows that my placing his reign from 1495 to 1456 B.C. only differed from his real date by about thirty years."[93] Most writers place the first of the Rameses about 1320 B.C., which will not at all tally with the Scripture account of the period which follows.

The Amenophis of Chaeremon should not be set in opposition to Thothmosis, seeing that in the 18th dynasty, as given by Africanus, Eusebius, and on the tablet of Abydos, we have Amemophis, Horus, Thothmosis, Acencheres and Rameses, all together, and among them Thothmosis and Amenophis in intimate connection.[94]

I am quite prepared to say, with Sir J. G. Wilkinson, that the arguments in favour of placing the Exodus after Rameses II. are exceedingly strong. It is, however, an undesigned coincidence of Eusebius with the statements of Manetho and Africanus that furnishes the strongest ground for making a Thothmosis the Pharaoh of the Exodus. In the list which he gives of the 18th dynasty, he passes by Thothmoses and Rameses, and appends to the name of an Acencheres,

[85] Annales, Vet. Test. p. 17.
[86] Rawlinson, Herod. Appendix, bk. ii. c. 8.
[87] Lepsius' Letters, 424.
[88] Monumental History of Egypt, p. 595.
[89] Ancient History of the East, vol. 1, p. 261.
[90] Josephus Cont. Ap. i, 14, 26.
[91] Ap. Euseb. Prep. Evan. x, 10.
[92] Syncellus, 63, B, &c.
[93] Ancient Egypt, abridged, ii, 255.
[94] Kenrick's Ancient Egypt, ii, 167, &c.

who stands midway between them, the note, "Under him Moses led the Jews in their exodus from Egypt."[95] The name Acencheres, either in full or in a mutilated form as Acherres, occurs twice or three times in all the lists of the 18th dynasty; and in one list, that of Africanus, as given by Du Pin in his Bibliotheque Universelle des Historiens, it occurs in its complete form, and, in each case, with a reign of twelve years appended.[96] The first Acencheres follows a Horus, although, on the tablet of Abydos, Rameses is the name that occupies a similar position, and Thothmosis III, in an inscription, arrogates to himself the name of Horus.[97] I may also here remark that, in the Canon of the 18th dynasty of Manetho, as given by Theophilus, Chencheres, who is this Acencheres, immediately precedes Sethos Miammu, which is a name of the great Rameses, and of him only.[98] The name Acencheres has been much overlooked by writers on Egyptian history. Mr. Osburn finds a connection for it between Mesphres Thothmosis and his son, who is at the same time his grandson, also called Thothmosis.[99] It is true, he does not identify Acencheres with either of these, but represents him as a son of the first and an uncle of the second. He shows, however, that in him the names Acencheres and Thothmosis meet, and thus reconciles the statement of Eusebius with other early records, in which a Thothmosis is made the unhappy Pharaoh. Both Thothmosis and Acencheres, from their frequent repetition, appear to be dynastic names, indicating of themselves no particular individual. On the tablet of Abydos we find Mesphres, Acencheres and Thothmosis represented by three Thothmoses; and the lists of Syncellus and Eusebius name the same trio Misaphris, Misphragmuthosis and Touthmosis. Of the latter Kenrick says: "Misaphris or Miphres and Misphragmuthosis have the appearance of both originating from a title and a phonetic name, Miphra Touthmosis or Tothmes beloved of Phre. These will be the Tothmes I. and II. of the tablet; and the Touthmosis of the lists will correspond with the Tothmes II. of the Tablet."[100] Misphragmuthosis is said by Manetho to have been the new Pharaoh who first subdued the Shepherds, and his son Thummosis or Thothmosis, the king in whose reign the exodus of Israel took place.[101] In Thothmosis and his predecessor Mesphres Thothmosis, whose reign, according to

[95] Euseb. Armen. Canon, vol. ii, p. 105.
[96] Du Pin Bib. Un. des Historiens, p. 273.
[97] Osburn's Mon. His. of Egypt, ii, 300.
[98] Cory's Ancient Fragments, 158.
[99] Osburn's Mon. His. of Egypt, ii, 183, &c.
[100] Kenrick's Ancient Egypt, ii, 170.
[101] Josephus Cont. Ap. i, 14.

Osburn, must have been an exceedingly long one, we must have the Pharaoh of the Exodus and the first enslaver of Israel. But there is another individual, called Mesphres, whose reign is constantly of the same length as that of Acencheres, namely, twelve years.[102] Now, the death of Mesphres, father and grandfather of Thothmosis, took place in the twenty-third year of the age and reign of the latter.[103] No inscription of Thothmosis is found later than the thirty-fifth year of his age and reign, thus giving to him a true reign of twelve years.[104] He dwelt at On or Heliopolis, worshipped the god Ra and built a temple to him, oppressed the Israelites, inaugurated songs in his own honour in the temple of Karnak, and was adored as the great Horus and son of the sun.[105] The most remarkable statement, however, made in regard to him is that he was the offspring of an incestuous marriage,[106] a crime which, by a very strange coincidence, is not only charged upon Mesphres and his daughter Amenses, but also upon Rameses the Great and his daughter Bent Anat,[107] from whom doubtless came the successor of Rameses, Setei Menephthah. An inscription designates Thothmosis *Son-mautf*, brother of his mother.[108] We may reasonably conclude that the three dynastic names and religious designations, Acencheres, Mesphres and Thothmosis, to say nothing as yet of Rameses, Sethos and Menephthah or Merenphtah, are equally applicable to two individuals at least, one of whom stands in the double relation of father and grandfather to the other.

The name Acencheres seems to consist, like most Egyptian names, of two parts, the latter, *cheres*, common to many other words, as Mencheres, Nephercheres, Zebercheres, being a kind of Charis or strongly aspirated Horus. The first part of the name, Acen or Aken, is an epithet of Vulcan, and corresponds to the Sanscrit Agni and the Latin Ignis, so that Ptah would be another form for it, Ptah being Hephaestus.[109] The whole name has much in common with the Greek Agenor, or with Cenchrias the son of Neptune, mentioned by Pausanias.[110] We

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[102] See lists of kings 18th dyn., Cory's An. Frag.
[103] Osburn's Mon. His. of Egypt, ii, 231, 303.
[104] Kenrick's Ancient Egypt, ii, 196.
[105] Osburn's Mon. His. of Egypt, ii, 208, &c.
[106] Id. ii, 301.
[107] Lenormant & Chevalier's Manual, i, 256.
[108] Osburn's Mon. His. of Egypt, ii, 302.

[109] De Lanoye's Ram. Gt., p. 78. We also find the designation Haqan changed to Hickpoun, belonging to a Rameses (De Lanoye, 172); and the Rev. W. B. Galloway, Egypt. Record, 371, speaks of Rameses Khenephres. In each the Aken appears.

[110] There is a decided connection of Agenor with Phœnicia, and, as we shall see, of Egypt with Phœnicia, about the time of the Exodus. Buttman proves that Cnas is the Phœnician name of Agenor (Mythol. i, 232); and Ernest Renan shows that the Phœnicians, in the time of

have seen that the initial vowel is not at all constant, as in the form Cencheres given by Theophilus, which is almost the same as Concharis, the last Lower Egyptian king in the list of Syncellus, in whose fifth year the Cynic Cycle was completed.[111] It is said that this Concharis must be the Timaeos of Manetho, under whom a great calamity, supposed to be the Shepherd invasion, happened to Egypt.[112] That it was not the Shepherd invasion is abundantly manifest, since all the Rameses precede him, and the king after whom the Shepherds came was not Concharis but Mencheres.[113] Timaeus or Concharis is thus the unfortunate king, and last of his race of another and later period, his two names connecting with Thothmosis (in the form Thummosis) and Acencheres. The Pharaoh of the Exodus, or his near relations, occur under a somewhat disguised form of the same name Acencheres in two quotations from ancient writers.[114] The form is Chenephres or Knaphra instead of Cencheres, *phres*, *phra* or *phre*, the sun, taking the place of the ordinary termination *cheres*, as in the case of Menophres substituted for Mencheres. The first of these quotations is from Artapanus. He says that Palmanothes bore himself severely towards the Jews, and compelled them to build Kessa and the temple in Heliopolis. He had a daughter named Merris, who married a king named Chenephres, then reigning in Memphis, for there were at that time several kings in Egypt. She brought up a child of the Jews, and named it Moses, whom the Greeks called Musaeus. The second, from Bar-Hebraeus, states that Trimuthisa, called Damris by the Hebrews, daughter of Amenophathis and wife of Knaphra, was the person who saved Moses. Now, Amenophathis, who has a long reign of forty-three years assigned him, immediately precedes Pharoun Phsunu, the drowned in the Red Sea, and is himself preceded by Tumuthus, a form of Thothmosis, and Miphrus with the standard reign of twelve years, who in this place is made immediately to follow the Shepherds.

In addition to Acencheres Mesphres Thothmosis, the first who was the enslaver of the Israelites, and his son and grandson, who perished in the Red Sea, our attention has been drawn by the monuments and the historical extracts to the princess who comes between them. One

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the Hebrews, called their land Chna or Cna, Stephanus of Byzantium and Hecataeus both knowing it by the former name (*vide* Baldwin's Prehistoric Nations, 137).

111 Syncellus, in Cory's Ancient Fragments, 140.

112 Kenrick's Ancient Egypt, ii, 159-160.

113 Osburn's Mon. History of Egypt, i, 351.

114 Cory's Ancient Fragments, 161, 165.

is loath to think that the daughter of Pharaoh, who saved the infant Moses, is the utterly abandoned woman of whom the monuments speak. There may easily have been more than one daughter of the great Mesphres, exercising at different times a regal or vice-regal prerogative, since Lenormant gives the name of the guardian of young Thothmosis' minority as Hatasu,[115] which is plainly the Atossa of ancient story, made the same as Semiramis, and a name different from any mentioned by Egyptian historiographers in this connection. Still, even Hatasu assumes the dress and names of a man,[116] as does Amenses or Amenset, occupying the same position between Thothmosis I. and Thothmosis III. Josephus, who calls the princess that saved Moses Thermuthis,[117] places before Mesphres a princess named Amerses or Amesses, and a little later mentions another princess called Acencheres, daughter of Horus.[118] For the latter no confirmation can be found, and the former is easily reconciled with Amenses. The name Amerses is not unlike the Merris of Artapanus or even the Damris of Bar-Hebraeus. The Alexandrian chronicle calls the same queen Myrina. I may also state that, as Bar-Hebraeus makes Damris the daughter of Amenophath, so we find that Amenset is called the sister of Amenophis, son of Thothmosis, and daughter of Amosis or Thothmosis himself.[119] There is much obscurity here in the matter of relationships, which it would be useless to attempt to remove in this paper. The great facts that stand out prominently amid it all, and which are quite sufficient for the purposes of argument, are that the dynastic names, Acencheres, Mesphres and Thothmosis, are intimately connected with the Pharaoh of the Exodus, and that two of the monarchs bearing

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115 Lenormant & Chevalier's Manual, i, 229.

116 The facts of a warlike queen succeeding a great conqueror such as Mesphres Thothmosis, of her dress and habits being those of a man, of the names connected with her being Ahmes, Amosis, Amesses, &c., and of other names applied to her being Hatasu (Atossa) and Myrina, are strong links to bind the traditional Semiramis and the Amazons in one. I do not dwell on Menones, Ascalon, Jupiter Ammon as connected with the myth of Semiramis, nor on the Indian Umes (Ahmes) whence Umasoona, or the Semi-Ramessi, both of whom are Parvati: these I hope to take up on a future occasion.

117 Josephus Antiq. ii, ix, 7. Thermuthis is simply Toermaut, great mother.

118 Id. Cont. Ap. i, 15. The confusion in this extract from Manetho is very great. The Mephres who follows Amesses is plainly the Pharaoh of the Exodus, with his twelve years' reign. The preceding Amenophis is the son of Thothmosis who died before him, generally called Thothmosis II. Chebron is altogether out of place: and the first Tethmosis is the first Mesphres. The rest of the list is a simple repetition of the two kings who ruled independently, the one that during his lifetime acted as viceroy, and the queen that stands between the two former, and is called sister of the latter.

119 Kenrick's Ancient Egypt, ii, 172.

these names connect in a female relation, whom we may confidently call Amerses after Josephus, since he does not connect the Exodus with this name.

There are a few hints that I would throw out before leaving this part of the subject, as to the forms under which, in addition to that of Thummosis and Tumuthus, the name Thothmosis may appear. Timaeus has already been connected with Concharis. Plato, in his Phædrus, joins Thamus, the old king of Egyptian Thebes, with Teuth or Thoth.[120] Thum, the god whose name occurs in Pithom, should not be a stranger to the Rameses line. Even Teutamas, the so-called Assyrian king, who sent Memnon to Troy, in spite of the generally allowed discrepancy in time, may have links to bind him to Thothmosis.[121]

In the reign of the Pharaoh of the Exodus there existed an intimate connection between Egypt, Phœnicia and Greece.

It is hardly necessary to do more than quote the words of Lenormant and Chevalier in regard to the reign of Thothmosis III, who follows his elder sister, the warlike queen, called by them Hatasu.[122] The wall catalogue of Karnak gives an account of Thothmosis' march from Gaza in Philistia, which he made the base of his military operations, to Megiddo under Mount Carmel, where he defeated the allied army of Asia. Then he passed on triumphantly through Palestine, as far as Lebanon, and eastward to the Euphrates. It also describes his expedition, four years later, into Cœle-Syria, which he subdued, together with the Phœnician coast, to his sceptre. He created a fleet on the Mediterranean, doubtless manned by Phœnicians, who, from the date of their submission to Thothmosis, preserved for many centuries towards his kingdom an unshaken fidelity, in complete contrast with the conduct of other Canaanitish peoples. The fleets of the great Pharaoh conquered Cyprus and Crete, and subjected the southern islands of the Archipelago, a large part of the coasts of Greece and Asia

[120] Plato Phædrus, iii, 274, &c.; see also Galloway's Egypt. Record, 106.

[121] Teutamas sent Memnon to Troy. Memnon, however, is made by Syncellus the same as Amenophis, the son of Thothmosis, who is followed by Horus and Acencheres. That Teutamas is called king of Assyria need not interfere with the connection any more than Memnon's being called a Persian as well as an Ethiopian. The Rev. W. B. Galloway shows (Egypt. Record, 147) that Assyria or Athyria was an old name for Egypt. I have already stated that the new Egyptian line had oriental, Syrian and Assyrian, connections. This fact may be alluded to in Isaiah lii, 4: "My people went down aforetime into Egypt to sojourn there; and the Assyrian oppressed them without cause." Pliny places the siege of Troy in the time of Rameses Miamun and testimony from other authors is not wanting in support of his statement.

[122] Lenormant and Chevalier's Manual, i, 231, &c.

Minor, and possibly even the south of Italy.[123] Allowing, with these writers, that Merenphtah, son of the great Rameses, is the Pharaoh of the Exodus, which I have not the slightest difficulty in doing, so long as Acencheres Mesphres Thothmosis is not excluded from that unenviable position, we find even more intimate connections of Egypt with Greece and Phœnicia.[124] In his time, Gebal or Byblus, Berytus, Sidon, Sarepta and Tyre are described as subject to Egypt. His first enemies, in addition to the Libyans, the Pelasgian Tyrrhenians, Sicilians and Sardinians, were Pelasgians of Crete, Achaeans of Peloponnesus and Laconians. These statements are made on the authority of monumental evidence of the most unquestionable character.

The facts of Egyptian supremacy in Phœnicia, and of warfare between Egypt and Greece in the reign of the Pharaoh of the Exodus being thus established, there can be no antecedent improbability in the assumption that the event which terminated his reign and life was known both to Phœnicians and Greeks. To the Phœnicians, as faithful subjects of the Egyptian empire, the news would bring sorrow second only to that of the Egyptians themselves. To many of the Greeks the overthrow of their great enemy would undoubtedly be matter of rejoicing; but those who had taken no part in the warfare between the two peoples would be led by their Phœnician sympathies to join in the general cry of lamentation for the woes of the master of the world. This lamentation might be supposed very naturally to perpetuate itself in rite and story such as are associated with the name of Adonis.

III.—The circumstances connected with the death of the Pharaoh of the Exodus, his names and parentage, clearly point him out as the Adonis of Phœnicia and Greece.

The death of the Pharaoh of the Exodus with all his army would of itself be a national calamity not easily forgotten. It would not, however, be a peculiar case, for frequently of many a gallant army that has gone forth in all the pomp and circumstance of war, but a few stragglers have returned to tell the tale of disaster and defeat. The smiting of the first born throughout the whole land, concerning which

[123] We have no evidence that the Egyptian power ever extended beyond the confines of Phœnicia and Syria. No Egyptian army, in the ancient times referred to, ever visited Asia Minor, much less Greece or Italy. The Pharaohs met Greeks and Italians in Libya, Egypt, Palestine and southern Syria; but no proof has yet been given that the said Greeks and Italians were the natives of any other regions than those in which they encountered the Egyptians. If immigrants at all, they came from the east, and assuredly not from the west.

[124] Lenormant and Chevalier's Manual, i, 256-260.

Moses divinely instructed said, "There shall be a great cry throughout all the land of Egypt, such as there was never like it nor shall be like it any more,"[125] was a greater calamity still. Universal mourning must have accompanied that awful event which Scripture so simply records, "There was not a house where there was not one dead."[126] Such universal mourning I find connected with Adonis and with no other character in ancient mythology. The story of his death is well known. Ardently attached to the chase, he insisted, in spite of the entreaties of Venus, in going in pursuit of wild beasts, and was killed by a boar (which some ancient writers state is only a figurative way of saying that he fell in battle against a fierce enemy)[127] against an encounter with which he had been specially warned. The people of Byblus in Phœnicia, of many places in Cyprus, and of most Grecian cities, held an annual festival in his honour, or in commemoration of his death. "On the first day all the citizens put themselves in mourning; *coffins were exposed at every door;* the statues of Venus and Adonis were borne in procession with certain vessels full of earth, in which the worshippers had raised corn, herbs and lettuce, and these vessels were called the gardens of Adonis. After the ceremony was over, they were thrown into the sea or some river, where they soon perished, and thus became emblems of the premature death of Adonis, who had fallen, like a young plant, in the flower of his age."[128]

The extract just given leads to a connection of Adonis with water, such as we should expect to find in the case of one representing the Pharaoh who met his death in the Red Sea. The Adonis river, below Byblus and not very far from the NahrelKelb, on the face of whose rocky cliff the great Rameses Thothmosis left three inscriptions, at certain seasons of the year was fabled to flow red with the blood of the favourite of Venus. Cocytus also, personified as a physician, is said to have washed the incurable wound of Adonis.[129] Another remarkable

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[125] Exodus, xi, 6.

[126] Exodus, xii, 30.

[127] Banier, i, 550.

[128] Anthon's Classical Dictionary, Art. Adonia.

[129] Banier, i, 559. In connection with this, I would refer to the 111th chapter of the second book of Herodotus, which, with much that bears upon the story of the Pharaoh of the Exodus and upon that of Adonis, is unfit for transcription. The following is the Rev. W. B. Galloway's eloquent comment upon the passage:—"This was the king (Pheron or Sesoois II.) to whom Moses was commissioned, and whose hardened heart and infatuated blindness to the irresistible will of God admitted of but one remedy. That blindness is said to have been judicially inflicted upon the king for his impiety towards God in smiting the river by hurling his spear into the midst of its swollen and angry waters. The Lord hardened Pharaoh's heart, and his infatuated blindness lasted, according to the allegory, as many years as there are counted plagues of Egypt. The dreadful corruption of manners is scoffingly depicted in the allegory. The king, and indeed

connection is found in the fish called Adonis, mentioned by Ælian, which is equally at home in the sea and on the shore, and which the naturalist thought was so called because Adonis was in love with two goddesses, one of the land and the other of the sea.[130] Finally, in this connection, we have the statement of Lucian, of which Mr. Kenrick thus speaks: "There is a close resemblance between the rites which related to the death and revival of Adonis at Byblus, and of Osiris in Egypt.[131] Some of the people of Byblus claimed to have the sepulchre of Osiris among them, and maintained that all the rites commonly referred to Adonis properly related to Osiris. Their connection appears from the story related by Lucian, that a head formed of papyrus, or a vessel of papyrus containing a letter, was annually thrown into the sea

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all his dominions, are represented as hardly possessing one chaste and faithful wife. Yet there was one who was destined to be found faithful to her lord, and who would effect the decisive cure of his blindness. The chaste, bright Erythræan Sea had been mystically betrothed and wedded to Egypt. Hasten, O Pharaoh! gather together all thy royal state. Thy blindness shall be removed; thine eyes shall be washed and opened in the waters of the bright Erythræan, and thou shalt sleep ever after in the embraces of thy one faithful wife, the bright, chaste sea. Go, with oriental pomp and luxury; take with thee all thy harem, the lewd ministers of thy revellings, and all thy faithless wives and concubines. They shall have their reward. They all shall be hopelessly shut up as in a walled city, in the Erythræan glebe, into which thou shalt have gathered them; and even as when a city is burned, they shall see the narrowing and narrowing space, the nearer and nearer bursting and crashing and falling in of the encircling walls on every side; the surging, eddying and roaring of the resistless and rapidly advancing element in which they are inevitably doomed to be engulfed!"—*Egypt. Record*, 403.

130 *Ælian de Natura Animalium*, L. ix, c. 36. The explanation which Ælian fails to give may be found in the words of inspiration:—"The waters returned and covered the chariots and the horsemen, and all the host of Pharaoh that came into the sea after them: there remained not so much as one of them. * * * And Israel saw the Egyptians dead upon the sea-shore."—Exod. xiv, 28, 30. It is to be remarked that Pharaoh is not specially mentioned among the drowned. Bishop Patrick thus writes, in his commentary upon the first of the verses quoted above: "Some have fancied that all the host of Pharaoh did not perish, but only so many of them as pursued the Israelites into the sea, which they fancy this place intimates some did not. But the plain meaning is that they all came into the sea after the Israelites, and were all drowned in it. It is a wilder fancy that Pharaoh alone was saved by the angels Michael and Gabriel, because he cried out, as he had done heretofore (Exod. ix, 17), 'The Lord is righteous, and I and my people are wicked.' Thus the author of *Dibre Hajamim* (or the Life and Death of Moses), who says they transported him to Nineveh, where he reigned as long as the Israelites wandered in the wilderness. The same is related by other such fabulous writers, who are soberly confuted by Aben Ezra from the following words: 'There remained not so much as one of them;' and from Exodus, xv, 4, 19, where Moses, in his song, plainly makes Pharaoh to have perished among the rest." The restoration of Adonis to life, commemorated in the Finding of Adonis, may connect with such statements as Aben Ezra sought to disprove.

131 I cannot agree with this author and others in their belief that Osiris and Adonis are the same. Osiris I regard as very much older, and identical with the Phrygian Atys, the Arabian Ad, and the Egyptian Actoes of the lists or Ati of the monuments, who was killed, like Actaeon, by his own guards. It is, however, not at all unlikely that the old Typhonian myth was superseded by the later catastrophe, and that the Solar Rameses Thothmosis was put in the place of his ancestor, the Solar Ati, who preceded the Shepherds, being himself often reckoned as one of them.

at Alexandria, and floated to Byblus, and, by its arrival there, informed the women of Byblus that Adonis was found. Now, the mourning for Adonis is evidently the same as the mourning for Thammuz, spoken of by Ezekiel, and therefore the Egyptian mourning was probably an ancient custom, not one introduced by the Greeks at Alexandria. Since the papyrus grew in Phœnicia as well as in Egypt, it would be easy to keep up this ceremony of the annual exhibition of the head or the vessel of papyrus at Byblus."[132] This connection of water is an element well worthy of consideration in identifying Adonis with Pharaoh.

An Egyptian dirge, which Herodotus links with Phœnicia and Cyprus, and which might easily be the later form of the great cry that rose throughout Egypt when the first-born were slain by the angel of death, next engages our attention. "The Egyptians adhere to their own national customs, and adopt no foreign usages. Many of these customs are worthy of note; among others, their song, which is sung under various names, not only in Egypt, but in Phœnicia, in Cyprus, and in other places; and which seems to be exactly the same as that in use among the Greeks, and by them called Linus. There were very many things in Egypt which filled me with astonishment, and this was one of them. Whence could the Egyptians have got the Linus? It appears to have been sung by them from the very earliest times; for the Linus, in Egyptian, is called Maneros, and they told me that Maneros was the only son of their first king,[133] and that, on his untimely death, he was honoured by the Egyptians with these dirge-like strains; and in this way they got their first and only melody."[134] From the notes of Prof. Rawlinson, the translator of the above extract, we learn that Maneros was supposed to connect with Horus, son of Osiris; that Pausanias states that "Linus and Adonis were sung together by Sappho;" and that Athenaeus tells of Nymphis speaking of a youth having gone to fetch water for the reapers, who never returned, and was lamented by different people, in Egypt being called Maneros.[135] I think that Maneros and Mencheres are the same word, the breathing in

[132] Kenrick's Ancient Egypt, i, 348.

[133] This would be quite true in regard to the later Egyptians, for the father of the Pharaoh of the Exodus was their first king, and his successor was his only remaining son, all the others having died before him. Mencheres the older did not die an untimely death, and was not the son of the first king of any line.

[134] Herodotus, L. ii, c. 79.

[135] Rawlinson's Herodotus, notes to book ii, c. 79.

the latter becoming strong and guttural, as in the case of the Hebrew *Heth*,[135*] which is almost invariably rendered by *Chi* in the Septuagint. Mencheres was the last king of any note of the line that preceded the Shepherds, a line to which the new race pretended to belong, and was held in high honour by them. *Men* with *terra*, *teru-ra* and *ra* affixed to it, appears in the 44th, 46th and 49th places of the tablet of Abydos, Rameses Miamun occupying the 51st and last; and the name Mencheres was even adopted as a title, either in the original form or as Menophres.[135**] Mencarus, the name of a god or hero, mentioned by Strabo, may possibly connect, since the Men which enters into its composition stands for the moon, as does the Men of Mencheres, and no satisfactory derivation can be proposed for the *carus*, while Mencheres was certainly made a god in Egypt.[136] Nuncoreus, whom Pliny makes the son of Sesoosis and the same as Pheron, who lost his sight, is but another form of Mencheres, the N taking the place of the M, as in the case of Memphis, which in Hebrew is Moph or Noph.[137] The form Menophres, in which *phre*, or the sun, takes the place of *cheres*, which I believe must connect with Horus in some such way as the Charites and the Horae connect, is an interesting and suggestive one. It may be the same as the Mainphre of Mainphre Siphthah, whose name appears in connection with Rameses III, and whom Mr. Osburn makes the guardian of the Pharaoh of the Exodus.[138] It is worthy of remark that Ovid, in the 7th book of his Metamorphoses, speaks of one Menephron, called Menophrus by Hyginus, as guilty of a crime equal in turpitude to that which the father of the Pharaoh of the Exodus, whether Thothmosis or Rameses, committed.[139] A still more remarkable connection of the name is found in the statement of Theon, the astronomer, that a Sothiac cycle began in the reign of a king Menophres, whom Bunsen has given very strong reasons for making the same as Setei Menephthah II, who is generally supposed to be the drowned Pharaoh.[140] If with this we connect Sir J. G. Wilkinson's statement, given above, that Sothis rose

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135* Maneros may not be Mencheres, but Menra. If this be the case, the difference between Maneros and Menophres arises simply from the insertion of the Coptic article Ph, Phre and Re or Ra being the same word with and without the article.

135** Osburn's Monumental History of Egypt, i, 334, &c.

136 Strabo, L. xii, p. 31, c. viii, p. 20; *vide* note 135.

137 Pliny, N. H. xxxvi, 15.

138 Osburn's Monumental History of Egypt, ii, 553, &c. Mr. Osburn plainly identifies Mainphre Siphthah with the king called Chenephres or Knaphra by Artapanus and Bar Hebraeus.

139 Ovid, Metamorphoses, L. vii, 386; Hyginus, 253.

140 Kenrick's Ancient Egypt, ii, 247-8.

in the reign of Thothmosis III, and that of Syncellus, also mentioned above, to the effect that a Sothiac cycle was completed in the fifth year of Concharis, we shall find the chain of evidence that binds Mencheres or Menophres, or Mainphre Siphthah, Setei Menephthah, Thothmosis and Acencheres in one not easily to be broken.[141] We shall yet, however, find other than astronomical links in the myth of Adonis, with which to connect the music of Maneros.

The names of Adonis next engage our attention. The first of these, after Adonis itself, which, if applied to a man at all, must have designated a supreme lord or king, is Thammuz or Tammuz.[142] Almost all authorities are agreed that the Syrian Tammuz is Adonis. Milton, in conformity with the belief of mythologists even in his time, spoke of "smooth Adonis," that

> "Ran purple to the sea, supposed with blood
> Of Thammuz, yearly wounded."[143]

When the Jews relapsed into idolatry, they observed the annual festival that kept up not only a remembrance of Pharaoh's fate, but perpetuated his vile debaucheries.[144] I have already hinted at a connection between Timaeus, who is the same as Concharis, and Thamus, the old king of Egyptian Thebes. Bishop Cumberland, in his Essay on Sanchoniatho's Phœnician History, takes up this connection in the following language: "I think it most certain that this Timaeus, in Josephus, is but a different way of writing that eldest king Thamus, to whom Plato, in his Phædrus, informs us that Thoth showed his invention of letters in Egypt. Tau and Theta are letters easily changed in Greek; and in the East also those letters differ but by a point added to Tau (Hebrew). Thammuz is also the Hebrew name of Adonis or Osiris or Menes, the titles of Thoth's king and father. So *Chronicon Alexandrinum*, cited by Selden, makes Thammuz signify Adonis, who from Stephanus and Lucian, is known to be Osiris or the first king of Egypt."[145] Take away from the above passage the confusion which the

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[141] I find that the names Menophra Thothmosis are combined by Mr. Sharpe, the author of Chronology and Geography of Ancient Egypt, and by other writers. This agrees with the tablet of Abydos, in which Menra or Menerra is Amosis, the father of a Thothmosis.

[142] The Hebrew form is Tammuz as it is rendered in our English Scriptures, but the Septuagint write Thammuz.

[143] Paradise Lost, i, 446, &c.

[144] Ezekiel, viii, 14. One can hardly imagine an instance of blacker ingratitude than the weeping of the women of Israel for the fate of their greatest enemy, which was the cause of their greatest national deliverance, and should have been a subject of perpetual rejoicing.

[145] Sanchoniatho's Phœnician History, translated, &c., by the Rt. Rev. R. Cumberland, D.D., late Bishop of Peterborough, p. 359.

name of Osiris and the mention of the first king of Egypt create, and the statement of identity is not at all an improbable one. Certainly we know that there was an Egyptian god Thoum or Tum, after whom Pithom was named, who was honoured at Heliopolis, and whose name is frequently found upon the monuments of Rameses the Great.[146] The form Thummosis, given by Josephus, quoting Manetho,[147] instead of Thothmosis, can hardly be an accidental coincidence. If I could find any Egyptian name connecting this god with the termination *cheres* or *re*, in the same manner as Thoth is connected in Tatcheres of Manetho's fifth dynasty, I would not hesitate to embrace the Greek Thamyris, the unfortunate minstrel, who is of Ammonian birth, and gives name to a Phœnician river, the Tamyras, not very far from the Adonis, and to a class of Cyprian priests, in the number of mythical characters representing the Pharaoh of the Exodus.[148] My reasons for such a connection will appear more worthy of attention from what is to follow. We have already a Timaeus who is Concharis, and a Thothmosis, sometimes called Thummosis, who is an Acencheres or a Cencheres. With Timaeus, by means of Plato's old king Thamus, the Syrian Thammuz has been linked. It remains to find a synonym for Thammuz, in order to complete the third pair of allied names. There is a title of Adonis which furnishes all that is desired. It is Gingras.[149] This name at once suggested a comparison by the similarity of sound with "Pharaoh Cingeris, who pursued the children of Israel as they fled from slavery, and perished in the Red Sea with all his army," as Dr. Keating informs us in his History of Ireland, compiled from the ancient Irish chronicles.[150] I am not aware that the name of this or any other Pharaoh appears in any ancient Irish document. Dr. Keating may have taken it from Eusebius. Let that be as it may, the argument will not be affected. The name is simply suggestive as affording a step in the descending scale which brings Acencheres down to a form that bears much the same relation to it which Maneros bears to Mencheres. That form is Cinyras, which is but a variation of the name Gingras. Cinyras

146 Lepsius' Letters from Egypt, &c., p. 448.

147 Josephus Cont. Ap. i, 14.

148 I have since found the name required, which indeed has been lying on the surface all along. Re-Athom or Re-Thoum simply requires the transposition of its constituents to give a name very near to Thamyris, especially in their allowable and not uncommon forms Thumerra.

149 Guigniaut Religions de l'Antiquite, ii, 45.

150 Keating's General History of Ireland, translated from the original Irish, &c., by Dermod O'Connor, Esq., p. 107.

was the father of Adonis, and the word often designates Adonis himself, being plainly a dynastic name. As late as the time of Pompey, we are informed by Strabo that a tyrant of Byblus, the city of Adonis, bore this name;[151] and a class of priests called Cinyrads long disputed with the Tamyrads the religious supremacy in Cyprus.[152] Thus we have found four instead of three pairs of names that exhibit unmistakeable signs of a common origin:

I. { Timaeus / Thamus } —Concharis. III. Thammuz.—Gingras.

II. { Thummosis / Thothmosis } — { Acencheres. / Cencheres. / Cingeris. } IV. { Tamyras / Thamyris } —Cinyras.

There are other names of Adonis which cannot very well be considered apart from the story of his birth and parentage. Before leaving this part of the subject, however, the consideration of the names already mentioned may furnish us with a confirmation of the relevancy to the story of Adonis of the Egyptian Maneros in its double aspect of music and mourning. Thamyris himself is the disciple of Linus, the vanquished of the Muses, the blinded for his presumption. Gingras is the name of a small flute, and is applied to querulous tones, such as might be produced by an instrument of the kind; and from Cinyras come the Greek verb *kinuromai*, meaning to utter a plaintive sound, lament, wail, &c., and other words of similar signification.[153]

The story of the birth of Adonis and the names of his parents are given with great variations by different authors. Apollodorus, among Greek writers, and Ovid, among the Latins, are the chief authorities on these points; but before investigating their statements it will be well to dispose of the composite accounts given by Newton and Le Clerc. Sir Isaac Newton says that the Venus of Syria was Calycopis, daughter of Otreus, king of Phrygia, who married Thoas or Vulcan, surnamed Cinyras, who was king of Cyprus and Byblus. With this Venus, Adonis is joined.[154] M. Le Clerc's is given by the Abbé Banier, who accuses Newton of building his story upon a short passage in Tacitus.

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151 Strabo, Lib. xvi, c. xi, § 18.

152 Guingniaut ii, 211, 1021.

153 A very remarkable musical connection, which, while it draws Cinyras and Thamyris together, exhibits the enmity of the Greek towards the supposed king of Byblus, is found in Eustathius. He says that Cinyras was cursed by Agamemnon, engaged in a musical contest with Apollo and perished by his hand. Guigniaut, ii, 219.

154 The Chronology of Ancient Kingdoms Amended, cited by Banier, Vol. ii, 160.

Le Clerc followed Selden and Marsham, taking Phurnutus or Cornutus and other mythologists as his authorities, and omitting Ovid from the number. He says that Cinnyr or Cinyras, grandfather of Adonis, having one day drunk to excess, was exposed after the manner of Noah, and that his daughter-in-law, Mor or Myrrha, wife of his son *Ammon*, with her son Adonis, having seen him in this state, were, on his awaking, cursed by him, and fled to Arabia. Some time afterwards Adonis, with Ammon his father, and his mother Myrrha, went to *Egypt*. There Ammon died, and Adonis became king. Astarte or Isis was his wife, whom he loved with great tenderness. Having gone to Syria, he was wounded by a wild boar near Mount Lebanon, and Astarte, believing him dead, inaugurated great lamentations in his honour. He recovered from the wound, but the annual festival was retained. Banier cites Lucian and Plutarch as authorities for making the rites of Adonis and those of Osiris the same, giving many reasons why they should be so regarded.[155] One thing at least must appear very probable from this account, viz., the Egyptian connection of Adonis. According to Apollodorus, the most ancient authority, Cinyras, the father of Adonis, descended from Hermes and the daughter of Cecrops through Cephalus, whom Aurora carried to Syria, Tithonus, Phaethon, Astinous and Sandochus,[156] who went from Syria to Cilicia and became the father of Cinyras, king of the Assyrians, by Thanacea or Pharnace, daughter of Megessareus. Cinyras went to Cyprus, and, having married Metharme, daughter of Pygmalion, king of the Cyprians, had two sons, Oxiporus and Adonis, and three daughters, Orsedice, Laogore and Bresia. These daughters married strangers, and died in *Egypt*. Adonis was early killed by a wild boar. He states that some writers make the mother of Adonis Alphesibœa, daughter of Phœnix, and that Panyasis derives him from Thoas, king of the Assyrians, and his daughter Myrrha, sometimes called Smyrna.[157] Ovid, with Hyginus, following the more common tradition, call Adonis the son of Cinyras and his daughter Myrrha.[158]

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[155] Banier, i, 549-50.

[156] The name Sandochus is made by Bochart the same as Sadoc or Sydyk, in accordance with a rule of etymology that appears in the changes of the Semitic Hud or Hoddu into the Indo-European Hindoo, and even in the *n*, which is inserted in the present and other tenses of the indicative and other moods of Latin verbs (*e. g.* frangere) not being part of the root. *Vide* Bochart Geographia Sacra, Lib. i, c. 5. Sydyk is Soutech, which, in its form of Sethos or Seti, forms part of the name of the father of the great Rameses, Seti Menephthah I. *Vide* Osburn, ii, 385-6, &c. Lenormant and Chevalier, i, 241. Kenrick, ii, 214.

[157] Apollodorus, iii, xiv, 3, &c.

[158] Ovid Met. x, 290, &c. Hyg. Fab. 58.

Ovid makes Cinyras the son of Paphos, whom others make his son, and Paphos the son of Pygmalion and the statue. Paphos is a purely Egyptian name, corrupted from Apophis or Epaphus, as Concharis and Cencheres from Acencheres. The city of that name in Cyprus is said to have been founded by Cinyras, son of Apollo, or by Paphos, son of Cinyras, or, according to Tacitus, by Ærias, an old name of Egypt.[159] In addition to the double connection of Adonis with Pygmalion, through his mother Metharme and his father Cinyras, there is a link to bind him in another of his names, which is Pygmæon.[160] Pygmæon and Pygmalion bear a similar relation to one another, to that which exists between Myrsus and Myrsilus, who are united as father and son,[161] and the longer form doubtless connects with the Egyptian festival of the Paamylia mentioned by Plutarch, which was the occasion of a phallic ceremony.[162] Stripped of their contradictions, these various narrations give us in Pygmalion and his statue or daughter Metharme, Thoas and his daughter Smyrna, and Cinyras and his daughter Myrrha, the guilty pair of whom came Adonis or the Pharaoh of the Exodus. In Cinyras, Thoas, Pygmalion or Pygmæon, Abobus (which no doubt connects with Apophis and Paphos), Gingras and Thammuz, we have some of the many forms in which the titles of the two oppressors of Israel have been handed down; and in Metharme, Smyrna and Myrrha, it is not difficult to recognize Amersis, Myrina, or Merrhis, the daughter of Pharaoh. While Acencheres and Thothmosis are reproduced in Cinyras and Thammuz, the Mesphres which unites them is not left unaccounted for or unnoticed in the myth. Mesphres or Miphre, literally "beloved of *re* or the sun," is a solar designation identical with Mithras,[163] a *phi* which is the Coptic article, unnecessary inasmuch as Meire answers every purpose, taking the place of a similarly useless *theta*. This opens up a great Persian connection, on which, according to my promise, I forbear at present to enter.[164] The line of

[159] Anthon's Class. Dict. Art Paphos.

[160] Guigniaut, ii, 926.

[161] *Vide* Rawlinson, note in Herod, i, 7.

[162] DeIside et Osiride, xii.

[163] It is not a mere accidental coincidence that appears in Pliny's naming the first Egyptian King who erected an obelisk to the sun Mestres, whom Mr. Sharpe, in his Early History of Egypt, identifies with Mesphres Thothmosis (Pliny Hist. Nat. xxxvi, 13, &c.), and in Belus, II, father of Pygmalion, being surnamed Mestres also (*Vide* Banier, iii, 492, note ; Notes of Gronovius in Justin, xviii, 4). Neither is it unworthy of attention that the name Agenor, already mentioned as a probable form of Acencheres, occurs in the same family.

[164] *Vide* Guigniaut, i, 375. Mithras is brought from Ethiopia and Egypt, being identified with the Greek hero Perseus, whom I hope to identify in some future paper with the great Rameses or Thothmosis. In the Assyrian Cann Mithreus precedes Teutamas.

Pharaohs to which the Thothmoses and Rameses belong, is one essentially solar in its character, its Ra and Horus designations plainly distinguishing it in this respect. But Thammuz or Adonis is made by Macrobius to be no other than the sun;[165] and of him Lenormant says: "This famous person, who to the Greeks was but a simple Syrian hunter, was to the Phœnicians the sun-god himself."[166] "Ra or Erra," says Kenrick, "is the Coptic name for king, appropriated to the sun, like the names Baal, Melek, Adonai, which in the Syro-Arabian languages denote monarchy, and were also titles of the sun."[167] The affection of Venus for Adonis is not without its place in the history which Egyptian records teach us. Athor, supposed to be the Greek Aphrodite, and who is the Athara of Syria and the Astarte of Phœnicia, was specially worshipped by the Thothmoses and the Rameses, temples being erected by them in her honour, and her name and attributes being frequently given to their queens. Thus Setei Menephthah himself is said to have dedicated a temple to Athor,[168] and the lists of Eusebius, Syncellus and Theophilus unite Athoris and Cencheres, who are Venus and Adonis.[169]

Even in regard to the more remote ancestors of the personages I have sought to identify, coincidences are found which would be valueless if standing alone, but which tend to strengthen an independent argument. Thothmosis calls himself Horus, and Rameses is designated the son of Horus; so Cinyras Thammuz is made a son of Apollo. In the religious title, Thothmosis, the principal element is the name of the god Thoth, who is Hermes; and Cinyras, as we have seen in the genealogy given by Apollodorus, is a descendant of Hermes and the daughter of Cecrops, Cecrops himself being generally considered to have been an Egyptian. The occurrence of Tithonus, the first syllable of whose name is Teuth or Thoth, in the genealogy, and whose Egyptian affinities are seen in his son Memnon, called by Manetho the son of Thothmosis, tends to strengthen the connection.

In endeavouring to keep within the bounds prescribed for such a paper as this, I have been compelled to omit the mention of many incidents that would tend somewhat to justify the removal of the scene of events in the history of Adonis to regions farther south than those

[165] Macrob. Saturnal, L. i, c. 21.
[166] Lenormant and Chevalier, ii, 221.
[167] Kenrick, i, 328.
[168] Lepsius' Letters, 100.
[169] Cory's Ancient Fragments, 142, 158.

generally assigned them; such, for instance, as Ovid's statement that Myrrha fled from her father through Arabia, and the fabulous Panchaia of Euhemerus to Sabæa.[170] I trust, however, that enough has been said without these to make the case of identity—of which I am fully persuaded in my own mind—appear not improbable to the minds of some more competent to judge of its merits.

Let me briefly recapitulate. In the introduction I have argued that some myths may have an historical basis, and that, if history be found in them, there is no reason why it should not in certain cases be found to confirm the ancient Bible narrative. In my first theorem I stated that Egypt, Phœnicia and Greece were most intimately connected in various ways from very ancient times. After giving evidence for the truth of this statement, I concluded that there was no antecedent improbability in the assumption that the knowledge of such a calamity as the overthrow in the Red Sea should be possessed and retained by Phœnicians and Greeks, although the tradition would no doubt be perpetuated in a very corrupt form. My second theorem consisted of two parts, the first of which was that Acencheres Mesphres Thothmosis was the Pharaoh of the Exodus. Here a difficulty appeared in the candidature of a Rameses, or rather the son of a Rameses, named Menephthah or Merenphtah, for the position. Then the undesigned coincidence furnished by Eusebius and the monuments in Acencheres, with his many connections, brought the weight of evidence on the side of Thothmosis. The second part of the theorem was that in the reign of Thothmosis of the Exodus, the intimate relation already spoken of existed among Egyptians, Phœnicians and Greeks. Indisputable proof was given of this, it being shown, among other things, that Phœnicia in his time was subject to Egypt and a friendly dependency. My last point to be proved was that the circumstances connected with the death of the Pharaoh of the Exodus, his names and parentage, clearly point him out as the Adonis of Phœnicia and Greece. In proving this I inverted the order somewhat, taking Adonis instead of Pharaoh as the first term of comparison. I then showed, first, that the story of Adonis' death, and the ceremonies observed in connection with it, as bringing in the elements of water, representing an untimely end, and calling for universal mourning, might very well refer to the Pharaoh of the Exodus; second, that the names of Adonis are closely allied to those of Acen-

[170] Ovid Metam, x. 475, &c. There is nothing in the way of a connection of Panchaia with Phœnicia or the neighbouring regions, in which Pan was worshipped from time immemorial.

cheres Mesphres Thothmosis, and in such a variety of ways that no hypothesis of accidental coincidence can account for the similarity; third, that the incestuous birth of Adonis, together with the names of his parents, find an exact parallel in the history of Thothmosis; and finally, that, as representing the Sun-god as beloved of Venus, descended from Apollo, and of the line of Hermes, he reproduces the son of the Sun, favourite of Athor, the son of Horus, and prince of the line of Thoth, Acencheres Mesphres Thothmosis.

ON TRILINEAR CO-ORDINATES.

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The following method of treating the properties of the straight line occurred to me in 1867, since which time I have used it with advantage in the Lecture Room:

1. To find the equation of the line $A'B'C'$ which cuts the sides BC, CA, AB of the triangle of reference in the points A', B', C' respectively.

Let the angles at A', B', C' be denoted by θ, φ, ψ, respectively; then if P be a point in the line between A' and B' of which the trilinear co-ordinates are α, β, γ,

$$A'C' \cdot PB' + B'C' \cdot PA' = A'B' \cdot PC'$$

$$\therefore \frac{A'C'}{\sin\phi}\beta + \frac{B'C'}{\sin\theta}\alpha - \frac{A'B'}{\sin\psi}\gamma = 0$$

Similar relations hold for different positions of P.

If now the convention be made that α, β, γ are, respectively, negative according as P lies between B' and C', C' and A', A' and B', and positive in all other cases, the above relations may be written

$$\frac{B'C'}{\sin\theta}\alpha + \frac{C'A'}{\sin\phi}\beta + \frac{A'B'}{\sin\psi}\gamma = 0,$$

or

$$l\alpha + m\beta + n\gamma = 0, \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

which is the required equation.

The signs of (1) will evidently depend on the position of P.

2. From (1) it follows that

$$\frac{l \sin\theta}{B'C'} = \frac{m \sin\phi}{C'A'} = \frac{n \sin\psi}{A'B'} \quad \ldots\ldots\ldots\ldots \quad (2)$$

Let $B'C' = p'$, $C'A' = q'$, $A'B' = r'$, and let p, q, r be the perpendiculars from A, B, C on the line $A'B'C'$; then

$$A'B = \frac{q' \sin\psi}{\sin B}, \; AB' = \frac{p' \sin\psi}{\sin A}, \; AC' = \frac{p' \sin\phi}{\sin A}$$

$$p = AB' \sin\phi = \frac{p' \sin\phi \sin\psi}{\sin A},$$

$$q = A'B \sin\theta = \frac{q' \sin\psi \sin\theta}{\sin B},$$

$$r = A'C \sin\theta = \frac{r' \sin\theta \sin\phi}{\sin C},$$

$$\therefore \frac{p'}{\sin\theta} = \frac{p \sin A}{\sin\theta \sin\phi \sin\psi}, \text{ \&c.}$$

whence from (2) it follows that

$$\frac{l}{p \sin A} = \frac{m}{q \sin B} = \frac{n}{r \sin C}. \quad \ldots\ldots\ldots\ldots (3)$$

3. From (2), since $B'C' + C'A' + A'B' = 0$, there follows the relation

$$l \sin\theta + m \sin\phi + n \sin\psi = 0. \quad \ldots\ldots\ldots\ldots\ldots (4)$$

the signs being determined by the convention that lines measured in a direction contrary to the first named (as $B'C'$) are considered negative.

The relation (4) can also be deduced immediately from the two forms of the equation to the line

$$l\alpha + m\beta + n\gamma = 0 \text{ and } \frac{\alpha - f}{\sin\theta} = \frac{\beta - g}{\sin\phi} = \frac{\gamma - h}{\sin\psi}$$

4. To find the angles made by the line $l\alpha + m\beta + n\gamma = 0$ with the sides of the triangle of reference.

In (4) θ, φ, ψ are always $< \pi$; but that relation may also be written in the equivalent form

$$l \sin\theta_1 + m \sin\theta_2 + n \sin\theta_3 = 0,$$

the previous convention being neglected, if θ_1, θ_2, θ_3 be the angles which the sides of the triangle of reference when projected make with the given line.

Projecting a, b, c on a line perpendicular to the given line we get

$$a \sin\theta_1 + b \sin\theta_2 + c \sin\theta_3 = 0$$

$$\therefore \frac{\sin\theta_1}{bn - cm} = \frac{\sin\theta_2}{cl - an} = \frac{\sin\theta_3}{am - bl}$$

$$= \left\{ \frac{2 \sin A \sin B \sin C}{(bn - cm)^2 \sin 2A + \ldots.} \right\}^{\frac{1}{2}} \quad \ldots\ldots (5)$$

since (*vide* Can. Jour. 1865) $\sin^2\theta_1 \sin 2A + \ldots = 2 \sin A \sin B \sin C$.

It may be noted that

$$(bn - cm)^2 \sin 2A + \ldots = 4\triangle \left\{ l^2 + \ldots - 2mn \cos A - \ldots \right\}$$

And

$$l\cos\theta_1 + m\cos\theta_2 + n\cos\theta_3 = \left\{ l^2 + \ldots - 2mn\cos A - \ldots \right\}^{\frac{1}{2}} \quad \ldots\ldots\ldots (6)$$

5. If two lines (l, m, n), (l', m', n') are parallel, it follows from (5) that

$$\frac{bn - cm}{bn' - cm'} = \frac{cl - an}{cl' - an'} = \frac{am - bl}{am' - bl'}.$$

6. To find the condition that the two lines (l, m, n), (l', m', n') shall be perpendicular to each other.

From the relations (4) and (6) we get

$$l\sin\theta_1 + m\sin\theta_2 + n\sin\theta_3 = 0$$
$$l\cos\theta_1 + m\cos\theta_2 + n\cos\theta_3 = R, \text{ suppose}$$
$$l'\cos\theta_1 + m'\cos\theta_2 + n'\cos\theta_3 = 0$$
$$l'\sin\theta_1 + m'\sin\theta_2 + n'\sin\theta_3 = R'$$

Multiplying the 1st and 4th of these equations together, and also the 2nd and 3rd, and adding the resulting equations, we get

$$ll' + \ldots + (m'n + mn')\cos\overline{\theta_2 - \theta_3} + \ldots = 0,$$

or

$$ll' + \ldots - (m'n + mn')\cos A - \ldots = 0,$$

the required condition.

7. To find the length of the perpendicular p from (f, g, h) on (l, m, n).

The equations to the line through (f, g, h) perpendicular to (l, m, n) are

$$\frac{\alpha - f}{\cos\theta_1} = \frac{\beta - g}{\cos\theta_2} = \frac{\gamma - h}{\cos\theta_3} = p$$
$$= \frac{l(\alpha - f) + \ldots}{l\cos\theta_1 + \ldots}$$
$$= -\frac{lf + mg + nh}{l\cos\theta_1 + m\cos\theta_2 + n\cos\theta_3}$$
$$= \frac{lf + mg + nh}{\left\{ l^2 + \ldots - 2mn\cos A - \ldots \right\}^{\frac{1}{2}}}.$$

The relation (3) follows at once from this.

8. To find the distance d between the points (α, β, γ), $(\alpha', \beta', \gamma')$.

From the equations to the line

$$d = \frac{\alpha - \alpha'}{\sin\theta} = \frac{\beta - \beta'}{\sin\phi} = \frac{\gamma - \gamma'}{\sin\psi},$$

$$\therefore d^2 = \frac{(\alpha - \alpha')^2 + (\beta - \beta')^2 + (\gamma - \gamma')^2}{2 \sin A \sin B \sin C}$$

since $\sin 2A \sin^2\theta + \ldots = 2 \sin A \sin B \sin C$.

9. To find the angle λ between the lines (l, m, n), (l', m', n').

Let $(\theta_1, \theta_2, \theta_3)$, $(\varphi_1, \varphi_2, \varphi_3)$ be the angles made by the lines with the sides of the triangle of reference; then

$$\cos\theta_1 + m\cos\theta_2 + n\cos\theta_3 = R$$
$$\sin\theta_1 + m\sin\theta_2 + n\sin\theta_3 = 0$$
$$l'\cos\phi_1 + m'\cos\phi_2 + n'\cos\phi_3 = R'$$
$$l'\sin\phi_1 + m'\sin\phi_2 + n'\sin\phi_3 = 0$$

Multiplying the second and third of these together, and also the first and fourth, and subtracting the resulting equations, we get

$$ll' \sin\overline{\theta_1 - \phi_1} + \ldots + mn' \sin\overline{\theta_2 - \phi_3} + m'n \sin\overline{\theta_3 - \phi_2} + \ldots =$$

$$\therefore (ll' + \ldots)\sin\lambda + mn' \sin(\overline{\theta_2 - \theta_3} + \overline{\theta_3 - \phi_3})$$
$$+ m'n \sin(\overline{\theta_3 - \theta_2} + \overline{\theta_2 - \phi_2}) + \ldots = 0$$

which reduces to

$$(ll' + \ldots)\sin\lambda + (mn' - m'n)\sin\overline{\theta_2 - \theta_3}\cos\lambda$$
$$+ (mn' + m'n)\cos\overline{\theta_2 - \theta_3}\sin\lambda + \ldots = 0$$

$$\therefore \tan\lambda = \frac{(m'n - mn')\sin A + \ldots}{ll' + \ldots - (m'n + mn')\cos A - \ldots}.$$

November 12, 1870.

PAUL KANE, THE CANADIAN ARTIST.

In the earlier numbers of the new series of the *Canadian Journal*, several papers on various Indian tribes of the North West, from the pen of Paul Kane, attracted considerable attention, as the results of travel and personal observation in the remote Hudson's Bay Territory, and beyond the Rocky Mountains. Their author had long been known in Canada as a self-taught artist of great promise, who had devoted himself to the study of the native Indian tribes of British North America; and his contributions to this journal were the first published results of explorations, the fruits of which were afterwards set forth in more comprehensive form in his "Wanderings of an Artist among the Indians of North America," published by Messrs. Longman & Co., of London, in 1859.

The recent death of Mr. Kane invites some special notice of him in this journal, to which he was for some time a valued contributor. His father, Mr. Michael Kane, was originally in the British Army, and served latterly, we believe, in the small force which accompanied Lieutenant-Governor Simcoe, when he removed to the selected site of the future capital of Western Canada, in 1794. On his leaving the army, he settled in the newly founded city, where his son was born in 1810. Toronto was then, and long afterwards, a very humble little back-wood settlement. The Mississaga Indians, whose wigwams occupied the cleared ground near the mouth of the Don, when Colonel Bouchette made his first survey in 1793, long continued to haunt this favourite spot; while an Indian trail through the partially cleared pine forest, to the old French Fort, and another northward to Holland Landing, were the precursors of the long lines of costly stores, hotels, and public buildings, which now extend for miles along King and Yonge streets.

In the midst of this conflict between the artless rudeness of savage life, and the progressive energy of the Anglo-Saxon colonist, young Paul grew up from boyhood, with few external influences calculated in the slightest degree to stimulate artistic tastes, or to direct his attention to the study of Indian manners and customs. For the Indian, as seen in his worst debasement, haunting the centres of new civilisation, is little calculated to attract the eye of the artist or ethnical observer.

Nevertheless, Mr. Kane remarks, in the preface to his Travels, when referring to his resolution to devote himself to painting a series of studies of North American scenery and Indian life: "The subject was one in which I felt a deep interest in my boyhood. I had been accustomed to see hundreds of Indians about my native village: then Little York, muddy and dirty, just struggling into existence, now the City of Toronto, bursting forth in all its energy and commercial strength."

The youth of the future artist and traveller was passed amid all the disadvantages pertaining to the infancy of the embryo city. What little education he had was mainly received at the District Grammar School. There also he obtained whatever instruction he received in the art to which he was to devote his life, from Mr. Drury, a clever but eccentric teacher of drawing. But his early manifestations of an artistic bias were regarded as the mere purposeless amusements of a boy; and his disinclination for the ordinary trading pursuits, which alone promised profitable occupation in the young settlement, seemed to unappreciative seniors only a further proof of his distaste for the restraints of steady industry. The circumstances of the community were indeed too frequently inimical to the fostering of settled habits among its youth. Dr. Scadding has remarked, when describing the first years of the District Grammar School, that "during the time of the early settlements in this country, the sons of even the most respectable families were brought into contact with semi-barbarous characters. A sporting ramble through the woods, a fishing excursion on the waters, could not be undertaken without communication with Indians and Half-breeds, and bad specimens of the French voyageur. It was from such sources that a certain idea was derived, which, as we remember, was in great vogue among the more fractious of the lads at the school at York. The proposition circulated about, whenever anything went counter to their notions, always was to run away to the Nor' West! What that process really involved, or what the Nor' West precisely was, were things vaguely realised. A sort of savage land of Cocagne, a region of perfect freedom among the Indians, was imagined; and to reach it, Lakes Huron and Superior were to be traversed." In this way young Kane's mind was early familiarised with the idea of that expedition across the continent, to ocean shores beyond the Rocky Mountains, of which he has left so many memorials by means of his facile pencil and pen.

The first industrial pursuits of the boy appear to have been carried on in the employment of Mr. Conger, subsequently sheriff of Peterborough, but then engaged in the manufacture of household furniture. In this occupation his latent talent found expression in the ornamentation of various pieces of furniture, till he began to be recognized as one whose artistic abilities deserved encouragement. But in his native village no works of art existed to furnish the slightest hint to the aspiring boy, and no teacher could be found to supply adequate instruction. He was thus a purely self-taught artist. Some of his crude efforts at portraiture would probably have amused himself at a later date. But his early patrons were, fortunately, not too critical; and thus he was enabled to overcome the first difficulties of his artistic career, and to save a little money for making an independent start in life.

His first scene of artistic labour, after leaving Toronto, was Cobourg, where portraits of Sheriff and Mrs. Conger, her sister Mrs. Perry, Sheriff Ruttan, and others of his early patrons, were executed. By this means he acquired sufficient funds to enable him to set off for the neighbouring States, there to try his fortune as a portrait painter, in the hope of accumulating the requisite means for the bold project he had already formed of visiting Europe, and perfecting himself in his favourite art by studying the works of the great masters. A letter from his father, addressed to him at Detroit, in 1836, speaks of difficulties that "will probably prevent your Italian excursion." Thereafter he is found, at various dates between that and the year 1841, at Mobile, St. Louis, and other American cities, closing with New Orleans, from whence he set sail, in June of the latter year, for Marseilles.

The following four years were spent by Paul Kane in some of the great cities of European art, studying and copying the works of the Italian masters. Unfortunately, a journal which he kept during this period has perished; so that the details of his continental sojourn are no longer recoverable. But we trace him, by means of his passports and other evidence, at Paris, Genoa, Milan, Verona, Venice, Bologna, Florence, Rome and Naples. While in the latter city, he availed himself of an offered passage in a Levantine cruiser, and visited the coasts both of Asia and Africa. He joined a party of Syrian explorers, and was already on his way to Jerusalem, when they were deserted by their Arab guides, and, after being exposed to great danger, were

compelled to return to the coast, and abandon the attempt. This failure to accomplish a visit to the most sacred scenes of the ancient historic world, was always a subject of mortifying reflection to him. It was on his return from this unsuccessful pilgrimage that he landed on some part of the African shore; and so was able to say, on regaining his Canadian home, that he had been in every quarter of the globe.

Mr. Kane brought back with him, as the fruits of his four years' professional tour, copies of famous pictures in the galleries of Venice, Florence and Rome. His mind had been enlarged by observation, and by intimate intercourse with artists trained in the best schools of Europe. A letter of introduction, given to him by an Irish artist, whose friendship he had acquired while at Rome, is addressed to the Right Rev. Dr. Purcell, Bishop of Cincinnati, in which the latter is urged by no means to miss the opportunity of seeing Mr. Kane's "admirable copy of Raffaelle's portrait of Pope Paul II." He also copied some of the most prized pictures in the Palazzo Pitti, at Florence; and on his return, brought with him well executed paintings from Raphael's Madonna in the Pitti Palace, and his portrait of Pope Julius II.; Leonardo da Vinci's and Rembrandt's fine portraits of themselves, in the Florentine gallery; Murillo's Madonna, in the Corsini Palace at Rome, and other favourite artistic studies; along with a highly finished copy of Busato's portrait of Pope Gregory XVI.

Stewart Watson, a well known Scottish artist, appears to have been one of his special friends while in Italy. They returned together from Italy to London, and there for a time shared the same lodgings and studio, "at Mr. Martin's, Russell-street." Another of his brother-artists, and fellow-travellers while in Italy, Mr. Hope James Stewart, thus writes to him from Edinburgh: "After London, this place looks like a dead city, and reminds me much of the way you and I felt the quietness of Rome, after our trip to that noisy and favourite place, Naples."

In 1844, Mr. Kane returned to Canada, with all the prestige of a skilled artist, who by his own unaided energy had overcome every obstacle, and achieved for himself opportunities of studying the works of the great masters in the most famous galleries of Europe. He was now to display the same indomitable energy and self-reliance in widely different scenes. In the preface to his "Wanderings of an Artist among the Indians of North America," he remarks: "On my return to Canada from the continent of Europe, I determined to devote

whatever talents and proficiency I possessed to the painting of a series of pictures illustrative of the North American Indians and scenery." On applying to Sir George Simpson, the Governor of the Hudson's Bay Company, and showing him studies of Indians he had already made, Sir George entered cordially into his plan; furnished him with letters of introduction to the chief factors at the Company's posts, and ordered him a passage in the brigade of canoes which was to start for Lake Superior in the spring of 1846. But before his arrangements could be completed,—including all the miscellaneous supplies required for an artistic tour through regions where it would be vain to seek for the most simple appliances of his art,—the voyageurs had set out, and he only succeeded in joining them, after much toil and hardship, before the party reached the mountain pass, forty miles above the Hudson's Bay Fort on the Kaministaqueah River, at the head of Lake Superior.

Mr. Kane's romantic experiences and adventures during the next four years are detailed with graphic truthfulness in the volume published by him in 1859. He crossed the continent in canoe and on foot, made his way up the valley of the Saskatchewan, and over the vast prairies beyond it, stretching westward to the Rocky Mountains. Crossing them, he navigated the Columbia River to Oregon, visited and explored Puget's Sound, Vancouver's Island, and other regions of the then savage West: which, though now rapidly filling up with European settlers, are described by him as "those wild scenes, amongst which I strayed almost alone, and scarcely meeting a white man, or hearing the sound of my own language." Everywhere his pencil was busily employed on portraits of chiefs, warriors, and medicine-men of the Indian tribes; and on hunting scenes, games, dances, and other characteristic native rites and customs. He pictured various of the Flathead Indians of the Cowlitz, Chinook, Newatee, and other tribes; had opportunities of studying the Crees, Blackfeet, Chimpseyans, Clalams and others, including even the Esquimaux; and was everywhere received among them with mingled respect and apprehension, as a great medicine-man, whose reproduction of their likenesses by his mysterious art was supposed to give him some strange power over them.

Among the most striking of the Indian portraits executed by him, is one of Kea-keke-sacowaw, head chief of the Crees, whom he met when travelling on the Saskatchewan, engaged in raising a war-party against the Blackfeet. He had with him eleven elaborately decorated pipe-stems, ten of which were the pledges of as many chiefs engaged

to join him in the proposed expedition. On learning that the artist was a great medicine-man, he agreed to exhibit to him the pipe-stems, in the belief that his sketching them would greatly increase their efficiency when opened on the war-path. A pipe-bowl was accordingly filled with tobacco and some aromatic weed; the chief chaunted a war-song; and then inserting one of the stems into the bowl, he lighted it, inhaled the smoke, and blew a long cloud upwards. This was his offering to the Great Spirit, whom he invoked to confer success on their expedition. Another prolonged puff, directed earthward, was followed by an appeal to the earth to produce an abundant supply of roots and buffalo for the coming season. The third was directed to Kane himself, with a request for his influence on their behalf. He had then to smoke all the eleven pipes; and thus enlisted in the cause, the portrait he then painted of the grim old chief, adorned with his war-paint, and holding in his hand his own pipe-stem, decorated with the head and plumage of an eagle, was esteemed a great medicine, calculated to contribute materially to the success of the war-party.

At length, after many wild adventures and hair-breadth escapes, Mr. Kane returned to Toronto in 1848, with a valuable portfolio of studies of Indians and scenery of the great North West. While still at the Saskatchewan, he received from Sir George Simpson a commission for a dozen paintings of "buffalo hunts, Indian camps, councils, feasts, conjuring matches, dances, warlike exhibitions, or any other pieces of savage life you may consider to be most attractive or interesting." Other commissions followed; and in 1851, by a vote of the Legislature of the Province of Canada, he was authorised to execute a series of Indian pictures which now hang in the Parliamentary library at Ottawa. But his most liberal patron was the Hon. G. W. Allan, to whom he subsequently dedicated the narrative of his travels, "as a token of gratitude for the kind and generous interest he has always taken in the author's labours; as well as a sincere expression of admiration of the liberality with which, as a native Canadian, he is ever ready to foster Canadian talent and enterprise."

In 1853, Mr. Kane married Miss Harriet Clench, of Cobourg, a lady who, among other attractions, had a skill with her pencil and brush akin to his own. Thus happily domesticated, with a companion able to sympathise with him in his artistic labours, Mr. Kane devoted himself to the execution of an extensive series of oil paintings, including one hundred pictures of Indian scenes, landscapes, portraits

and groups, now in the Hon. G. W. Allan's collection at Moss Park. There also a very curious collection of Indian implements, weapons, masks, drums, carvings and other specimens of native art, obtained by Mr. Kane, during his travels in the North West, is now preserved.

In 1857 he revisited Europe, and superintended the execution of the chromolithographic illustrations of his travels. On his return to Toronto in the following year, he resumed his pencil, and indulged in the long-cherished hope of being able to follow up that volume by a more extensive work, illustrative of the characteristics, habits, and tribal peculiarities of the Indians of British North America, and the scenery of the regions they occupy. But soon after his return to Canada his eye-sight began to fail; and he had scarcely completed the liberal commission of Mr. Allan, when he was compelled entirely to abandon the favourite art, which till then he had pursued with such energetic zeal, in defiance of every impediment.

Mr. Kane had, at least in his later years, somewhat of the quiet, unimpressible manner of the Indians, among whom he had spent some of the most eventful years of his life. A reviewer in the *Athenæum*, in noticing the published narrative of his travels, described him as "an American artist, who had studied in Europe, and apparently unites the refinement of the Old World with the Indian energy of the New." His memory was singularly retentive; and, in spite of his reserved manner, his descriptive powers were great, when he could be induced to give them free scope. In the company of those who did not sympathise with his favourite pursuits, his words were few and abrupt; but he was a man of acute observation, and, when questioned by an intelligent enquirer, abounded with curious information in reference to the native tribes among whom he had sojourned. His published narrative is a modest, but interesting and vivid description of novel scenes and incidents of travel; and his career is a creditable instance of the pursuit of a favourite art, by a self-taught artist, in spite of the most discouraging impediments to success. D. W.

CANADIAN INSTITUTE.

ANNUAL REPORT OF THE COUNCIL FOR THE YEAR 1869–'70.

The Council of the Canadian Institute have the honor to present the following Report of the proceedings of the Society for the past year from 1st December, 1869, to the 30th November, 1870.

MEMBERSHIP.

The present state of Membership is as follows:

Members at commencement of Session, December 1st, 1869		354
Elected during Session 1869–'70		5
" by Council during Recess		1
		360
Deduct.		
Deaths	5	
Withdrawn	3	
Left the Province	3	
For non-payment of Subscription	6	
		17
Total 30th November, 1870		343
Composed of		
Honorary Members		4
Life "		27
Corresponding Members		6
Ordinary "		306
Total		343

COMMUNICATIONS.

The following list of papers read at the ordinary meetings held during the Session will be found to contain many valuable communications, and some of general interest:

3*rd December*, 1869.—Rev. Prof. Hincks, "Ferns."
10*th December*, 1869.—Doctor C. B. Hall, "On Injuries of the Trachea."
17*th December*, 1869.—The Annual Report was read and adopted.
14*th January*, 1870.—Inaugural Address of the President, Rev. W. Hincks.
21*st January*, 1870.—Doctor Geikie, "On certain differences in the Treatment of Disease formerly and in recent times."
4*th February*, 1870.—Doctor Oldright, "On Acute Ergot Poisoning."
25*th February*, 1870.—Doctor D. Wilson, LL.D., "On the present state and future prospects of the Indian Race in British North America."
18*th February*, 1870.—Dr. Cumming's Paper postponed.
4*th March*, 1870.—Dr. Cumming, "On the changes in Therapeutics that have resulted from advances in Medical Science."
11*th March*, 1870.—No paper read. Mr. R. Lee was unavoidably absent.
18*th March*, 1870.—Doctor J. J. O'Dea, New York, "On Relapsing Fever."

25*th March*, 1870.—Rev. J. McCaul, LL.D., "On Ancient Scramblings."
1*st April*, 1870.—Doctor W. W. Ogden, "On Menorrhagia, with its Treatment by Bromide of Ammonium."
8*th April*, 1870.—J. Loudon, Esq., M.A., "On the Pronunciation of the Latin Language." R. Lee, Esq., "On the Native Tribes of Polynesia."
29*th April*, 1870.—Doctor Reeve, "On Diseases of the Ear."
6*th May*, 1870.—Doctor Thorburn read a paper by Dr. Eastwood, of Whitby, "On our Relations to the Public."
13*th May*, 1870.—"On a case of Injury to the Spine."
27*th May*, 1870.—Doctor Canniff, "Remarks on the Sanitary Condition of the City."
21*st October*, 1870.—Dr. Rosebrugh, "On Sympathetic Opthalmia."
25*th November*, 1870.—Dr. Geikie, "Notes of some cases of Typhoid Fever."

STATEMENT OF THE GENERAL ACCOUNT OF THE CANADIAN INSTITUTE, FOR THE YEAR 1869-70:

FROM THE 1ST DECEMBER, 1869, TO THE 30TH NOVEMBER, 1870.

Debtor.

Cash Balance last year			$597 78
" Received from Members			268 00
" For rent			86 45
" Parliamentary grant for 1870			750 00
" For Interest on loan of $3,100, to 7th January			186 00
" For Interest from other sources			52 64
" Due for *Journal*.... Old Series	0 33		
New Series	4 00		
			4 33
" Due by Members			1,755 75
" Due for *Journal*.... Old Series	114 25		
New Series	43 24		
			157 50
			$3,858 45

Creditor.

Cash paid for *Journal*, Vol. XII., Nos. 3, 4, 5, 6	$536 39
Compensation for Editor of *Journal*	240 00
Postage	9 05
Library and Museum	22 36
Cash paid on account of Institute—	
Salary	336 00
Insurance	102 25
Wood	57 25
Printing	49 50
Periodicals	58 49
Repairs to Building	87 15
Advertising	9 37
Postage	4 92
Stationery	6 44
Sundries	8 04
Estimated Balance	2,331 24
	$3,858 45

TREASURER IN ACCOUNT WITH THE CANADIAN INSTITUTE, FOR THE YEAR 1869-70—FROM THE 1ST DECEMBER, 1869, TO THE 30TH NOVEMBER, 1870.

Debtor.

Cash Balance last year		$597 78
" Received from Members		268 00
" For rent		86 45
" Parliamentary grant, 1870		750 00
" For Interest of $3,100, to 7th January, 1870		186 00
" For Interest from other sources		52 64
" Sale of *Journal* .... Old Series	0 33	
" Sale of *Journal* .... New Series	4 00	
		4 33
Securities		3,100 00
		$5,045 20

Creditor.

Cash paid for *Journal*, Vol. XII., Nos. 3, 4, 5, 6		$536 39
Compensation for Editor *Journal*		240 00
Postage		9 05
Library and Museum		22 36
Cash paid on account of Institute—		
Salary	336 00	
Insurance	102 25	
Wood	57 25	
Printing	49 50	
Periodicals	58 49	
Repairs to Building	87 15	
Advertising	9 37	
Postage	4 92	
Stationery	6 44	
Sundries	8 04	
		719 41
Securities		3,100 00
Balance Cash in Bank		417 99
		$5,045 20

Toronto, Dec. 12, 1870.

SAMUEL SPREULL.

The undersigned Auditors have compared the vouchers for the items of these accounts with the cash book, and find them to agree. The balance in hands of the Treasurer is $417 99.

W. J. MCDONELL,
GEO. MURRAY.

APPENDIX.

DONATIONS OF BOOKS RECEIVED.

From the Society—	VOLS.	
Journal Royal Asiatic Society, New Series, vol. iii. Part 2	1	*
" " iv. " 1	1	*
From the Royal Geographical Society—		
Vol. xxxviii, 1868	1	*
Proceedings of Royal Geographical Society, vol. xiii. No. 1, Feb. 10, 1869	1	*
" " " No. 2, April 17, "	1	*
" " " No. 3, July 20, "	1	*
" " " No. 4, May 24, "	1	*
Quarterly Journal of the Geological Society—		
Vol. xxiv, Part 4, Nov. 1st, 1868, No. 96	1	*
List of the Geological Society, Nov. 1st, 1868	I	*
Vol. xxv, Part 2, May 1st, 1869, No. 98	1	*
" " 3, August 1st, 1869, No. 99	1	*
Memoirs of the Literary and Philosophical Society of Manchester, vol. iii, Third Series (vol. xxiii, old)	1	*
Proceedings of ditto, vol. v, Session 1865-66	1	*
" " vol. vi, " 1866-67	1	*
" " vol. vii, " 1867-68	1	*
From the Linnean Society—		
Journal of Botany, vol. xii, 1869	1	*
Address of George Bentham, Esq., F.R.S., at the Anniversary Meeting of the Linnean Society, Monday, 24th May, 1869	1	*
The Journal of Zoology, vol. x, No. 43	1	*
" " " No. 44	1	*
" " " No. 45	1	*
" " " No. 46	1	*
List of the Linnean Society of London, 1868	1	*
The Journal of Botany, vol. x, No. 48	1	*
" " vol. xi, No. 49	1	*
" " vol. xii, Nos. 50 & 51	1	*
From the Royal Swedish Academy, Stockholm—		
Kongliga Svenska Vetenskaps Akademicus Handlingar ney Töljd Sjetta Banda Forsta Häftet, 1865	1	*
" " 1864 and 1866	2	*
" " 1867	1	1
Sketch of the Geology of Spitsbergen, by A. E. Nordenskiold	1	*
Hemiptera Africana, Descripsit Carolus Stal. Tomus Primus, Secundus, Tertius et Quartus	4	*
Conspectum avium Picinarum, Edidit Carolus J. Sundevall Custos Musei Zool. Stockholmiensis, 1866	1	*

* Marked thus not bound.

VOLS.

Die Thierarten des Aristoteles Von Den Klasson, &c., Carl J. Sundevall, &c., Stock., 1863 ..... 1 *

On the existence of Rocks, &c., Sweden, translated from Communications read to the Royal Swedish Academy of Sciences at Stockholm, 1867 1 *

Kongl. Svenska Vetenskaps-Akademien, May, 1866 ..... 1 *

" " " 1867 ..... 1 *

" " " 1868 ..... 1 *

" " " 1869 ..... 1 *

Om Gotlands Nutida Mollusker af G. Lindstrom, 1868 ..... 1 *

Lefnadsteckningar öfver Kongl. Svenska Vetenskaps Akademiens Efter ar 1854, Aflidna Ledamöter Band 1, Hafte 1 ..... 1 *

Ofversiglt af K. Vetenskaps-Akademiens Forhandlingar, $\frac{22}{1865}$ ..... 1 *

" " " $\frac{23}{1866}$ ..... 1 *

" " " $\frac{24}{1867}$ ..... 1 *

" " " $\frac{25}{1868}$ ..... 1 *

Netulandsch Meteorologisch Jaarbock Voor 1868, Utrecht, 1868 1

From the Society—

Records of the Priory of the Isle of Man, edited by John Stewart, LL.D., Secretary of the Society of Antiquaries of Scotland 1

From the Society—

Memoirs read before the Anthropological Soc. of London, 1867-8-9, vol. iii. 1

From the Boston Society of Natural History—

Report on the Invertebrata of Massachusetts, published agreeably to an order of the Legislature, 2nd edition, comprising the Mollusca, by Augusta A. Gould, M.D.; edited by W. G. Binny, Boston; 1870.... 1

From L. Heyden, Esq.—

Observations on the Right of British Colonies to Representation in the British Parliament; by Daniel Chisholm 1

Life of Colonel Talbot; by E. Ermatinger 1

From the Society of Antiquaries of North Copenhagen—

Renseignements sur les Premiers Habitants de la Cote Occidentale du Grooenland, par Carl Christian Rafn Traduits in Grooenlandais par Samuel Klimschmidt 1

From the Smithsonian Institution, Washington—

Smithsonian Miscellaneous Collections, vols. viii. & ix. ..... 2 *

Smithsonian Contributions to Knowledge, vol. xvi 1

From Rev. W. D. Stark—

Linnæi Species Plantarum, vols. i. & ii. 2

Latham's Index Ornithologus, vols. i. & ii 2

From the Queen's Printer—

The Statutes of Canada; 32 & 33 years of the reign of Her Majesty; 15th April, 1869, 22nd June same year; 1870 1

Bought—

Allibone's Dictionary of English Literature and British and American Authors, vol. ii 1

From the Societies—

The Journal of the Royal Asiatic Society, vol. iv, Part 2 ..... 1 *
The Journal of the Royal Geographical Society, vol. xxxix, 1869..... 1 *
Proceedings of " " " vol. xii, No. 5..... 1 *
" " " " vol. xiii, No. 5 ..... 1 *
" " " " vol. xiv, No. 1..... 1 *
" " " " vol. xiv, No. 2..... 1 *
List of the Geological Society, Nov. 1st, 1869..... 1 *
Quarterly Journal of ditto, Feb. 1st, 1869, vol. xxv, Part 1, No. 97..... 1 *
" " Nov. 1st, 1869, vol. xxv, Part 4, No. 100..... 1 *
" " Feb. 1st, 1876, vol. xxv, Part 1, No. 401..... 1 *
" " May 2nd, 1870, vol. xxvi, Part 2, No. 102.... 1 *
" " August 1st, 1870, vol. xxvi, Part 3, No. 103.. 1 *

DONATIONS OF PAMPHLETS RECEIVED.

From the Provincial Lunatic Asylum—
Report of the Medical Superintendent 1

From the Nova Scotia Institute—
The Antiquity of Man in America..... 1

From the Smithsonian Institution—
Istituzioni—di Diritto Commerciale, &c., 1867 3
Sulla Riabilitazione des Condannati Trattatos di Nicola Alianelli..... 1
Bur Tusohichte, &c. &c..... 1
Societe D'Ethnographie Fondée in 1857 and 1869..... 1
Norsk Meteorolgish Aarbog for 1868..... 1
Le Glacier de Boium in Juillet, 1868, par S. A. Saxe..... 1
Index Scholarum in Universitate Regia Fredericiania, 1869 1
En Anatomisk Beskrivelar af de Paa Overog Underextremitaterne, &c., af A. S. D. Synnestvedt 1
La Norvege Litteraire, Par Paul Botten Hausen, Christiania, 1868 1
Fortaelling om Thomas Becket, Eckebishop of Canterbury C.R. Unger,1865 1
Ungadresckte, Unbrachtete and wenig Beachtete Quellen, &c..... 1
Forhandlinger i Videnskabsselskabet J Christiania aar. 1868 ..... 1 *
" ved de Skandinaiske Natuforsheres Tiende Möde, J Christiania, Fra den 4de Til den 10de Iuli, 1868..... 1 *
Nyt Magazine for Naturvidenskaberne ved M. Sars og M. Kjerwolf. Sixtende Binds forste Hefte 1
Do. do. Sextende Binds fjerde Hefte Med 1, Lith Tavier..... 1 *
Do. do. Sextende Binds andet og tredie Hefte Med 2, Lith Tavier..... 1 *
Foreningen til Norske Fortidsmindesmerkers Bavaring, 1868. ..... 1 *
Det Kongilge Norke Videnskabersselskabs, skrifter i det 19 de Aarhundrede. Fente Bind, 1868..... 1 *
Do. do. 5te Binds 13te Hefte ..... 1 *
Beretning om Bodsfaengslats Virksomhed i aaret, 1868..... 1 *

En furnstilling af det Norske Aristokratis historie indtil Kong Svertes tid af Ebbe Hetzberg, 1869 ..... 1 *
Det Kongelige Norske Fredericks Universitets for aar, 1868 ..... 1 *
Generalberetning fra Gausted Sindssygeasyl for aar, 1868 ..... 1 *
Massachusetts ..... 1 *
The Principles of the Electic System of Medicine, by J. Morrison, M.D., M.A. 1 *
Report upon the Oyster Resources of Maryland, by H. Davidson, Esq., 1870 1 *
Report of Peabody Institute, Baltimore ..... 1 *

From the Author—

On the Graphite of the Laurentian of Canada, by J. W. Dawson, LL.D.. 1 *

From the Boston Natural History Society—

Address delivered on the Centennial Anniversary of the Birth of Alex. Von Humbolt, under the auspices of the Boston Society of Natural History, by Louis Agassiz, &c 1

From L. Heyden, Esq.—

Catalogue D'Ouvrages Sur L'Histoire de L'Amerique, &c 1

From the Institute, Baltimore—

Discourse on the Life and Character of George Peabody 1

From the University—

Abstract of the Annual Calendar of McGill College, 1870-71 1

Unknown—

Catalogue des Livres Anciens qui se Trouvent à la Librairie Tross, a Paris Annce, 1870, No. 5 1

From the Society of Antiquaries of North Copenhagen—

Memoires de la Societe Royale des Antiquaires du Nord, Nouville Serie, 1867 and 1868 2
Tilleag til Aarboger for Nordisk Oldkyndighed og Historie, Aargang 1867 and 1868 2

From the Museum, New-York State Library—

First Annual Report of the American Museum of Natural History, Jan. 1870 1
17th Annual Report of the Regents of the Uuiversity of the State of New York, Cabinet of Natural History, April, 1864 1
18th Annual Report of ditto, March 22nd, 1865 1
19th " " " April 2nd, 1866 1
20th " " " April 15th, 1867 1
22nd " " " April 10th, 1869 1
52nd " " of the Trustees of N. Y. State Library, Jan. 19, 1870 1
3rd " " of the Provost to the Trustees of the Peabody Institute, Baltimore, June 2nd, 1870 1

Through the Smithsonian Institution—

Abhandlungen herausgegeben Vom Naturwissensshaftlicshen Veriene Zu Bremen, 2 Bd. 2nd Heft, 1870 1

Verhandlungen der Kaiserlich-Koniglichen Zoologisch Botanischen Gelleschaft in Wien xix, Band. 1 Heft 1
Do. do. " ii. & iii. Heft..... 1
Do. do. " iv. Heft 1
Commelinaceae Indicae, Imprimis Archipelagi Indici adjectis Nonnullis hisce Tetris alienis, Auctore Carlo Hasskarl Ph. D. Vindobonae, 1870. 1
Beiträge zur Fauna der Nicobaren Von Georg. Ritter Von Frauenfeld, iii. 1
Das Gesitz der Winde, &c. Uber Nord West Europa, Von Dr. M. A. F. Prestel, &c. in Emden xiv, 1869..... 1

From the Superintendent of the Survey—
Records of the Geological Survey of India, vol. i, Part 1, 1868..... 1
" " " vol. i, Part 2, " 1
" " " vol. i, Part 3, " 1
" " " vol. ii, Part 1, 1869..... 1
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CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

(Continued from Vol. XII., p. 532.)

BY THE REV. DR. SCADDING.

XXXI.—QUEEN STREET FROM GEORGE STREET TO YONGE STREET.

When we pass George Street we are in front of the park-lot originally selected by Mr. Secretary Jarvis. It is now divided from south to north by Jarvis Street, a thoroughfare opened up through the property in the time of Mr. Samuel Peters Jarvis, the Secretary's son. Among the pleasant villas that now line this street on both sides, there is one which still is the home of a Jarvis, the Sheriff of the County. Besides filling the conspicuous post indicated by his title, Mr. Secretary Jarvis was also the first Grand Master of the Masons in Upper Canada. The archives of the first Masonic Lodges of York possess much interest. Through the permission of Mr. Alfio de Grassi who has now the custody of them, we are enabled to give the following extracts from a letter of Mr. Secretary Jarvis, bearing the early date of March 28th, 1792:—"I am in possession of my sign manual from his Majesty," Mr. Jarvis writes on the day just named, from Pimlico, to his relative Munson Jarvis, at St. John, New Brunswick, "constituting me Secretary and Registrar of the Province of Upper Canada, with power of appointing my Deputies, and in every other respect a very full warrant. I am also" he continues "very much flattered to be enabled to inform you that the Grand Lodge of England have within these very few days appointed Prince Edward, who is now in Canada, Grand Master of Ancient Masons in Lower Canada; and William Jarvis, Secretary and Registrar of Upper Canada, Grand Master of Ancient Masons in that Province. However trivial it may appear to you who are not a Mason, yet I assure you that it is one of the most honourable appointments that they could have conferred. The Duke of Athol is the Grand Master of Ancient Masons in England. Lord Dorchester with his private Secretary, and the Secretary of the Province, called on us yesterday" Mr. Jarvis proceeds to say "and found us in the utmost confusion, with half a dozen porters in the house packing up. However his Lordship would come in, and sat down in a small room which was reserved from the general bustle. He then took Mr. Peters home with him to dine: hence we conclude a favourable omen in regard to his consecration, which we hope is not far distant. Mrs. Jarvis," the Secretary informs his relative, "leaves England in great spirits. I am ordered my passage on board the transports with the Regiment, and to do duty without pay for the passage only. This letter," he adds, "gets to Halifax by favour of an intimate friend of Mr. Peters, Governor Wentworth, who goes out to take possession of his Government. The ship that I am alloted to is the *Henneker*, Captain Winter, a transport with the Queen's Rangers on board."

The Prince Edward spoken of was afterwards Duke of Kent and father of the present Queen. Lord Dorchester was the Governor-General of the Province of Quebec before its division into Upper and Lower Canada. Mr. Peters was *in posse* the Bishop of the new Province about to be organized. It was a part of the original scheme, as shewn by the papers of the first Governor of Upper Canada, that there should be an episcopal see in Upper Canada, as there already was at Quebec in the lower province. But this was not carried into effect until 1839, nearly half a century later. When Jarvis Street was opened up through the Secretary's park-lot, the family residence of his son Mr. Samuel Peters Jarvis, a handsome structure of the early brick era of York, in the line of the proposed thoroughfare, was taken down. Its interior fittings of solid black walnut were bought by Capt. Carthew and transferred by him without much alteration to a house which he put up on part of the Deer-park property on Yonge Street, (now the R. C. cemetery). A large fragment of the offices attached to Mr. Jarvis's house was utilized and absorbed in a private residence on the west side of Jarvis Street, and the gravel drive to the door is yet in some places to be traced in the less luxuriant vegetation of certain portions of the

adjoining flower gardens. Mr. Secretary Jarvis died in 1818. He is described by those who remember him as possessing a handsome, portly presence. Col. Jarvis, the first military commandant in Manitoba, is a grandson of the Secretary.

Of Mr. McGill, first owner of the next park-lot, and of his personal aspect, we have had occasion to speak in connexion with the interior of St. James's Church. Situated in fields at the southern extremity of a stretch of forest, the comfortable and pleasantly situated residence erected by him for many years seemed a place of abode quite remote from the town. It was still to be seen in 1870 in the heart of McGill Square, and was long occupied by Mr. McCutcheon, a brother of the inheritor of the bulk of Mr. McGill's property, who in accordance with his uncle's will, and by authority of an act of Parliament, assumed the name of McGill, and became subsequently well known throughout Canada as the Hon. Peter McGill. The founder of McGil College in Montreal was of a different family. The late Capt. James McGill Strachan derived his name from the connexion of his father by marriage, with the latter. In the *Gazette & Oracle* of Nov. 13th, 1803, we observe Mr. McGill of York advertising as "agent for purchases" of pork and beef to be supplied to the troops stationed "at Kingston, York, Fort George, Fort Chippewa, Fort Erie, and Amherstburg." In 1818 he is Receiver-General, and Auditor-General of land patents. He had formerly been an officer in the Queen's Rangers, and his name repeatedly occurs in "Simcoe's History" of the operations of that corps during the war of the American Revolution. From that work we learn that in 1779 he with the commander himself of the corps, then Lieut. Col. Simcoe, fell into the hands of the revolutionary authorities, and was treated with great harshness in the common jail of Burlington, New Jersey; and when a plan was devised for the Colonel's escape, Mr. McGill volunteered, in order to further its success, to personate his commanding officer in bed, and to take the consequences, while the latter was to make his way out. The whole project was frustrated by the breaking of a false key in the lock of a door which would have admitted the confined soldiers to a room where "carbines and ammunition" were stored away. Lieut. Col. Simcoe, it is added in the history just named, afterwards offered Mr. McGill an annuity, or to make him Quarter-master of Cavalry: the latter, we are told, he accepted of, as his grandfather had been an officer in King William's army; and "no man," Col. Simcoe himself notes, "ever executed the office with greater integrity, courage and conduct."

The southern portion of Mr. McGill's park-lot has, in the course of modern events, come to be assigned to religious uses. McGill Square, which contained the old homestead and its surroundings, and which was at one period intended, as its name indicates, to be an open public square, was secured in 1870 by the Wesleyan Methodist body and made the site of its principal place of worship and of various establishments connected therewith. Immediately north, on the same property, the Roman Catholics had previously built their principal place of worship and numerous appurtenances, attracted possibly to the spot by the expectation that McGill Square would continue forever an open ornamental piece of ground.

A little farther to the north a cross-street, leading from Yonge Street eastward, bears the name of McGill. An intervening cross-street preserves the name of Mr. Crookshank, who was Mr. McGill's brother-in-law.

The name that appears on the original survey of York and its suburbs as first occupant of the park-lot westward of Mr. McGill's, is that of Mr. George Playter. This is the Captain Playter, senior, of whom we have already spoken in our excursion up the valley of the Don. We have named him also among the forms of a past age whom we ourselves remember often seeing in the congregation assembled of old in the wooden St. James's. Mr. Playter was an Englishman by birth, but had passed many of his early years in Philadelphia, where for a time he attached himself to the Society of Friends, having selected as a wife a member of that body. But on the breaking out of the troubles that led to the independence of the United States, his patriotic attachment to old far-off England compelled him, in spite of the peaceful theories of the denomination to which he had united himself, promptly to join the Royalist forces. He used to give a somewhat humorous account of his sudden return to the military creed of ordinary mundane men. "Lie there, Quaker!" cried he to his cutaway, buttonless, formal coat, as he stripped it off and flung it down, for the purpose of donning the soldier's habiliments. But some of the Quaker observances were never relinquished in his family. We well remember, in the old homestead on the Don, and afterwards at his residence on Caroline Street, a silent

mental thanksgiving before meals, that always took place after every one had taken his seat at the table; a brief pause was made, and all bent for a moment slightly forwards. The act was solemn and impressive. Old Mr. Playter was a man of sprightly and humorous temperament, and his society was accordingly much enjoyed by those who knew him. A precise attention to his dress and person rendered him an excellent type in which to study the costume and style of the ordinary unofficial citizen of a past generation. Colonel M. F. Whitehead, of Port Hope, in a letter kindly expressive of his interest in these reminiscences of York, which we are endeavouring to record, has incidentally furnished a little sketch that will not be out of place here. "My visits to York, after I was articled to Mr. Ward, in 1819," Colonel Whitehead says, "were frequent. I usually lodged at old Mr. Playter's, Mrs. Ward's father. [This was when he was still living at the homestead on the Don.] The old gentleman often walked into town with me, by Castle Frank; his three-cornered hat, silver knee-buckles, broad-toed shoes and large buckles, were always carefully arranged." To the equipments, so well described by Colonel Whitehead, we add from our own boyish recollection of Sunday sights, white stockings and a gold-headed cane of a length unusual now. According to a common custom prevalent at an early time, Mr. Playter set apart on his estate on the Don a family burial-plot, where his own remains and those of several members of his family and their descendants were deposited. Mr. George Playter, son of Captain George Playter, was some time Deputy Sheriff of the Home District; and Mr. Eli Playter, another son, represented for some sessions in the Provincial Parliament the North Riding of York. A daughter, who died unmarried in 1832, Miss Hannah Playter, "Aunt Hannah" as she was styled in the family, is pleasantly remembered as well for the genuine kindness of her character, as also for the persistency with which, like her father, she carried forward into a new and changed generation, and retained to the last, the costume and manners of Queen Charlotte's days. As a specimen of the mode in which marriages were occasionally announced in our York papers in the olden time, we subjoin the record of a wedding in Captain Playter's family, as given in the *Gazette and Oracle* of December 29, 1798. "Married last Monday," the record runs, "Mr. James Playter to the agreeable Miss Hannah Miles, daughter of Mr. Abner Miles of this town."

XXXII.—QUEEN STREET—SOME MEMORIES OF THE OLD COURT HOUSE.

Immediately in front of the extreme westerly portion of the park-lot which we are now passing, and on the south side of the present Queen Street in that direction, was situated an early Court House of York, associated in the memories of most of the early people with their first acquaintance with forensic pleadings and law proceedings. This building was a notable object in its day. In an old plan of the town we observe it conspicuously delineated in the locality mentioned—the *other* public buildings of the place, viz., the Commissariat Stores, the Government House, the Council Chamber (at the present north-west corner of York and Wellington Streets), the District School, St. James's Church, and the Parliament House (by the Little Don), being marked in the same distinguished manner. It was a plain two-storey frame building, erected in the first instance as an ordinary place of abode by Mr. Montgomery, father of the Montgomerys, once of the neighbourhood of Eglinton, on Yonge Street. It stood in a space defined by the present line of Yonge Street on the west, by nearly the present line of Victoria Street on the east, by Queen Street on the north and by Richmond Street on the south. Though situated nearer Queen Street than Richmond Street it faced the latter and was approached from the latter. It was Mr. Montgomery who obtained by legal process the opening of Queen Street in the rear of his property. In consequence of the ravine of which we have had occasion so often to speak, the allowance for this street as laid down in the first plans of York had been closed up by authority from Yonge Street to Caroline Street. It was seriously proposed in 1800 to close up Queen Street to the westward also from Yonge Street "as far as the Common," that is, the Garrison Reserve, on the ground that such street was wholly unnecessary, there being in that direction already one highway into the town, namely Richmond Street, situated only ten rods to the south. In 1800 the southern termination of Yonge Street was where we are now passing, at the corner of Montgomery's lot. At this point the farmer's waggons from the north turned off to the eastward, proceeding as far as Toronto Street, down which they wended their way to Richmond Street, and so on to Church Street and King Street.

finally reaching the Market Place. Of the opening of Yonge Street through a tier of building lots that in 1800 blocked the way from Queen Street southwards we shall speak hereafter in the excursion which we propose to make through Yonge Street from south to north the moment we have finished recording our collections and recollections in relation to Queen Street.

In the *Oracle* for Saturday, January 21, 1804, we have this brief advertisement:—"The subscribers for opening Lot Street are requested to meet at Cooper's Hotel on Monday next at 11 o'clock in the forenoon. York, January 21st, 1804." No account of the meeting is afterwards given and the names of the subscribers do not appear.

According to the old plans, the original Toronto Street started southward from Queen Street exactly four chains and twenty links to the east of the present south-east corner of Yonge Street. It then ran, as we have said, a little to the west of the present Victoria Street which was first known as Upper George Street. The fact that the street which in modern times is called Toronto Street is the nearest passage to King Street from the lower end of what is virtually the old Toronto Street, probably suggested the name—Toronto Street.

In the old Court House, situated as we have described, we received our first boyish impressions of the solemnities and forms observed in Courts of Law. In paying a visit of curiosity subsequently to the singular series of Law Courts which are to be found ranged along one side of Westminster Hall in London—each one of them entered in succession through the heavy folds of lofty mysterious-looking curtains, each of them crowded with earnest pleaders and anxious suitors, each one of them provided with a judge elevated in solitary majesty on high, each one of them seeming to the passing stranger more like a scene in a drama than a prosaic reality—we could not but revert in memory to the old upper chamber at York where the remote shadows of such things were for the first time encountered. It was startling to remember of a sudden that our early Upper Canadian Judges, our early Upper Canadian Barristers, came fresh from these Westminster Hall Courts! What a contrast must have been presented to these men in the rude wilds to which they found themselves transported. Riding the Circuit in the Home, Midland, Eastern and Western Districts at the beginning of the present century was no trivial undertaking. Accommodation for man and horse was for the most part scant and comfortless. Locomotion by land and water was perilous and slow and racking to the frame. The apartments procurable for the purposes of the Court were of the humblest kind. Our pioneer jurisconsults in the several degrees, however, like our pioneers generally, unofficial as well as official, did their duty. They quietly initiated in the country, customs of gravity and order which have now become traditional; and we see the result in the decent dignity that surrounds, at the present day, the administration of justice in Canada in the Courts of every grade.

Prior to the occupation of Mr. Montgomery's house as the Court House at York, the Court of King's Bench held its sessions in a portion of the Government Buildings at the east end of the town, destroyed in the war of 1813. On June 25, 1812, the Sheriff, John Beikie, advertises in the *Gazette* that "a Court of General Quarter Sessions of the Peace for the Home District will be holden at the Government Buildings in the town of York on Tuesday the fourteenth day of July now next ensuing, at the hour of ten o'clock in the forenoon, of which all Justices of the Peace, Coroners, Gaolers, High Constables, Constables and Bailiffs are desired to take notice, and that they be then and there present with their Rolls, Records and other Memoranda to do and perform those things which by reason of their respective offices shall be to be done."

It is with the Court Room in the Government Buildings that the Judge, Sheriff and Crown Counsel were familiar, who were engulfed in Lake Ontario in 1805. The story of the total loss of the government schooner *Speedy*, Captain Thomas Paxton, is widely known. In that ill-fated vessel suddenly went down in a gale in the dead of night, along with its commander and crew, Judge Cochrane, Solicitor-General Gray, Mr. Angus McDonell, Sheriff of York, Mr. Fishe, the High Bailiff, an Indian prisoner about to be tried at Presquisle for murder, two interpreters, Cowan and Ruggles, several witnesses, and Mr. Herchmer, a merchant of York; in all thirty-nine persons, of whom no trace was ever afterwards discovered. The weather was threatening, the season of the year was stormy (7th October), and the schooner was suspected not to be sea-worthy. But the orders of the Governor, General Peter Hunter, were peremptory. Mr. Weekes, of whom we have heard before, escaped the fate that befel so many connected with his profession, by deciding to make the journey to Presquisle on horseback, which he did. It was the occurrence of this fatal casualty to Mr. McDonell that occasioned the vacancy in the

representation for which Mr. Weekes afterwards became the successful candidate. The name of the Indian who was on his way to be tried was Ogetonicut. His brother, Whistling Duck, had been killed by a white man, and he took his revenge on John Sharp, another white man. The deed was done at Ball Point on Lake Scugog, where John Sharp was in charge of a trading-post for furs belonging to the Messrs. Farewell. The Governor had promised, so it was alleged, that the slayer of Whistling Duck should be punished. But a twelvemonth had elapsed and nothing had been done. The whole tribe, the Muskrat branch of the Chippewas, with their Chief Wabbekisheco at thei head, came up in canoes to York on this occasion, starting from the mouth of Annis's creek near Port Oshawa, and encamping at Gibraltar Point on the peninsula in front of York. A guard of soldiers went over to assist in the arrest of Ogetonicut, who, it appears, had arrived with the rest. The Chief, Wabbekisheco, took the culprit by the shoulder and delivered him up. He was lodged in the jail at York. During the summer it was proved by means of a survey that the spot where Sharp had been killed was within the District of Newcastle. It was held necessary, therefore, that the trial should take place in that District. Sellick's, at the Carrying Place, was to have been the scene of the investigation, and thither the *Speedy* was bound when she foundered. Mr. Justice Cochrane was a most estimable character personally, and a man of distinguished ability. He was only in his 28th year, and had been Chief Justice of Prince Edward Island before his arrival in Upper Canada. He was a native of Halifax, in Nova Scotia, but had studied law in Lincoln's Inn, and was called to the Bar in England.

In the old Court House, near which we are now passing, were assigned to convicted culprits, with unflinching severity and in no inconsiderable number of instances, all the penalties enjoined in the criminal code of the day—the lash, the pillory, the stocks, the gallows. We have conversed with an old inhabitant of Toronto, who had not only here heard the penalty of branding ordered by the Judge, but had actually seen it in open court inflicted, the iron being heated in the great wood-stove that warmed the room, and the culprit made to stretch out his hand and have burnt thereon the initial letter of the offence committed.

Here cases came up repeatedly, arising out of the system of slavery which at the beginning was received in Canada, apparently as an inevitable part and parcel of the social arrangements of a colony on this continent. On the first of March, 1811, we have it on the record, "William Jarvis, of the town of York, Esq., (this is the Secretary again,) informed the Court that a negro boy and girl, his slaves, had the evening before been committed to prison for having stolen gold and silver out of his desk in his dwelling house, and escaped from their said master; and prayed that the Court would order that the said prisoners, with one Coachly, a free negro, also committed to prison on suspicion of having advised and aided the said boy and girl in eloping with their master's property." Thereupon it was "Ordered,—That the said negro boy named Henry, commonly called Prince, be re-committed to prison, and there safely kept till delivered according to law, and that the girl do return to her said master; and Coachly be discharged."

At the date just mentioned Slavery was being gradually extinguished by an Act of the Provincial Legislature of Upper Canada, passed at Newark in 1793, which forbad the further introduction of slaves, and ordered that all slave children after the 9th of July in that year should be free on attaining the age of twenty-five.

Most gentlemen, from the Administrator of the Government downwards, possessed some slaves. Peter Russell, in 1806, was anxious to dispose of two of his, and thus advertised in the *Gazette and Oracle*, mentioning his prices: "To be sold: a Black Woman named Peggy, aged forty years, and a Black Boy, her son, named Jupiter, aged about fifteen years, both of them the property of the subscriber. The woman is a tolerable cook and washerwoman, and perfectly understands making soap and candles. The boy is tall and strong for his age, and has been employed in the country business, but brought up principally as a house servant. They are each of them servants for life. The price of the woman is one hundred and fifty dollars. For the boy two hundred dollars, payable in three years, with interest from the day of sale, and to be secured by bond, &c. But one-fourth less will be taken for ready money. York, Feb. 19th, 1806. PETER RUSSELL."

According to our ideas at the present moment, such an advertisement as this is shocking enough. But we must judge the words and deeds of men by the spirit of the age in which they lived and moved.

Similar notices were common a century since in the English newspapers. It is in fact asserted that at that period there were probably more slaves in England than in Virginia. In the London *Public Advertiser*, of March 28th, 1769, we have, for example, the following: "To be sold, a Black Girl, the property of J. B——, eleven years of age, who is extremely handy, works at her needle tolerably, and speaks English perfectly well; is of an excellent temper, and willing disposition. Enquire of Mr. Owen, at the Angel Inn, behind St. Clement's Church, in the Strand." And again, in the Edinburgh *Evening Courant* of April 18th, 1768, we have, "A Black Boy to Sell. To be sold a Black Boy with long hair, stout made and well limbed; is good tempered; can dress hair, and take care of a horse indifferently. He has been in Britain near three years. Any person that inclines to purchase him may have him for £40. He belongs to Captain Abercrombie, at Brighton. This advertisement not to be repeated."

The poet Cowper sings—

> "Slaves cannot breathe in England: if their lungs
> Receive our air, that moment they are free;
> They touch our country and their shackles fall."

But this was not true until Lord Mansfield in 1772 uttered his famous judgment in the case of James Somersett, a slave brought over by a Mr. Stewart from Jamaica. Cowper's lines are in reality a versification of a portion of Lord Mansfield's words. A plea had been set up that villeinage had never been abolished by law in England; *ergo*, the possession of slaves was not illegal. But Lord Mansfield ruled: "Villeinage has ceased in England, and it cannot be revived. The air of England," he said, "has long been too pure for a slave, and every man is free who breathes it. Every man who comes into England," Lord Mansfield continued, "is entitled to the protection of English law, whatever oppression he may heretofore have suffered, and whatever may be the colour of his skin: *Quamvis ille niger, quamvis tu candidus esses.* Let the negro be discharged." But this is a digression.

Peter Russell's Peggy had been giving him uneasiness a few years previous to the advertisement copied above. She had been absenting herself without leave. Of this we are apprised in an advertisement dated York, September 2nd, 1803. It runs as follows: "The subscriber's black servant Peggy, not having his permission to absent herself from his service, the public are hereby cautioned from employing or harbouring her without the owner's leave. Whoever will do so after this notice may expect to be treated as the law directs. PETER RUSSELL."

In the papers published at Niagara advertisements similar to those just given are to be seen. In the Niagara *Herald* of January 2nd, 1802, we have, "For sale: A Negro man slave, 18 years of age, stout and healthy; has had the small pox, and is capable of service either in the house or out-doors. The terms will be made easy to the purchaser, and cash or new lands received in payment. Enquire of the printer." And again in the *Herald* of January 18th: "For sale; the Negro man and woman, the property of Mrs. Widow Clement. They have been bred to the business of a farm; will be sold on highly advantageous terms for cash or lands. Apply to Mrs. Clement."

Cash and lands were plainly beginning to be regarded less precarious property than human chattels. In 1797 purchasers, however, were still advertising. In the *Gazette and Oracle* of October 11th, in that year, we read: "Wanted to purchase, a negro girl from seven to twelve years of age, of good disposition. For fuller particulars apply to the subscribers, W. & J. Crooks, West Niagara, Oct. 4th."

In respect to the following notice some explanation is needed. We presume the "Indian slave" spoken of must have been only part Indian. The detention of a native as a slave, if legal, would have been difficult. Mr. Charles Field, of Niagara, on the 28th of August, 1802, gives notice in the *Herald*: "All persons are forbidden harboring, employing, or concealing my Indian slave Sal, as I am determined to prosecute any offender to the extremity of the law; and persons who may suffer her to remain in or upon their premises for the space of half-an-hour, without my written consent, will be taken as offending, and dealt with accordingly."

In the early volumes of the *Quebec Gazette* these slave advertisements were common. A rough wood-cut of a black figure running frequently precedes them. It appropriately illustrates the following one: "Run away from the subscriber on Tuesday, the 25th ult., a negro man, named Drummond, near six feet high, walks heavily; had on when he went away a dark

coloured cloth coat and leather breeches. Whoever takes up and secures the said negro, so that his master may have him again, shall have Four Dollars reward, and all reasonable charges paid, by John McCord. Speaks very bad English and next to no French." Another reads thus: "To be sold, a healthy Negro Boy, about fifteen years of age, well qualified to wait on a gentleman as a Body Servant. For further particulars inquire of the Printers."

Mr. Sol. General Gray, lost in the *Speedy*, manumitted by his will, dated August 27th, 1803, and discharged from the state of slavery in which, as that document speaks, "she now is," his "faithful black woman servant, Dorinda," and gave her and her children their freedom; and, that they might not want, directed that £1200 should be invested and the interest applied to their maintenance. To his black servants, Simon and John Baker, he gave, besides their freedom, 200 acres of land each, and pecuniary legacies. The Simon here named went down with his master in the *Speedy;* but John long survived. He used to state that his mother, Dorinda, was a native of Guinea, and to describe Governor Hunter as a rough old warrior, who carried snuff in an outside pocket, whence he took it in handfuls, to the great disfigurement of his ruffled shirt-bosoms. His death was announced in the public papers by telegram from Cornwall, Ontario, bearing date January 17, 1871. "A colored man," it said, "named John Baker, who attained his 105th year on the 25th ult., died here to-day. He came here as a chattel of the late Colonel Gray, in 1792, having seen service in the Revolutionary war. Subsequently he served throughout the war of 1812. He was wounded at Lundy's Lane, and has drawn a pension for fifty seven years." Mr. Gray, it may be added, was a native of our Canadian town of Cornwall. His place of abode in York was in what is now Wellington Street, on the lot immediately to the west of where the old "Council Chamber" (afterwards the residence of Chief Justice Draper) stood.

We ourselves, we remember, used to gaze, in former days, with some curiosity at the pure negress, Amy Pompadour, here in York, knowing that she had once been legally made a present of by Miss Elizabeth Russell to Mrs. Captain Denison.

But enough of the subject of Canadian slavery, to which we have been inadvertently led.

The old Court House, when abandoned by the law authorities for the new buildings on King Street, was afterwards occasionally employed for religious purposes. By an advertisement in the *Advocate*, in March, 1834, we learn that the adherents of David Willson, of Whitchurch, sometimes made use of it. It is there announced that "The Children of Peace will hold Worship in the Old Court House of York, on Sunday, the 16th instant, at Eleven and Three." Subsequently it became for a time the House of Industry or Poor House of the town.

Besides the legal cases tried and the judgments pronounced within the homely walls of the Old Court House, interest would attach to the curious scenes—could they be recovered and described—that there occurred, arising sometimes from the primitive rusticity of juries, and sometimes from their imperfect mastery of the English language, many of them being, as the German settlers of Markham and Vaughan were indiscriminately called, Dutchmen. Peter Ernest, appearing in court with the verdict of a jury of which he was foreman, began to preface the same with a number of peculiar German-English expressions which moved Chief Justice Powell to cut him short by the remark that he should have to commit him if he swore; when Ernest observed that the perplexities through which he and the jury had been endeavouring to find their way were enough to make better men than they were express themselves in an unusual way. The verdict, pure and simple, was demanded. Ernest then announced that the verdict which he had to deliver was, that half of the jury were for "guilty" and half for "not guilty." That is, the Judge observed, you would have the prisoner half-hanged, or the half of him hanged. To which Peter replied, that would be as his Lordship pleased. It was a case of homicide. Being sent back, they agreed to acquit. Odd passages, too, between pertinacious counsel and nettled judges sometimes occurred, as when Mr. H. J. Boulton, fresh from Inner Temple, sat down at the peremptory order of the Chief Justice, but added, "I will sit down, my Lord, but I shall instantly stand up again." Chief Justice Powell, when on the Bench, had a humorous way, occasionally, of indicating by a kind of quiet by-play, by a gentle shake of the head, a series of little nods, or movements of the eye or eyebrow, his estimate of an outré hypothesis or an ad captandum argument. This was now and then disconcerting to advocates anxious to figure, for the moment, in the eyes of a simple-minded jury, as oracles of extra authority.—Nights, likewise, there would be to be described, passed by juries in the

diminutive jury room, either through perplexity fairly arising out of the evidence, or through the dogged obstinacy of an individual. Once, as we have heard from a sufferer on the occasion, the late Colonel Duggan was the means of keeping a jury locked up for a night here, he being the sole dissentient on a particular point. That night, however, was converted into one of memorable festivity, our informant said, a tolerable supply of provisions and comforts having been conveyed in through the window, sent for from the homes of those of the jury who were residents of York. The recusant Colonel was refused a moment's rest throughout the livelong night. During twelve long hours pranks and sounds were indulged in that would have puzzled a foreigner taking notes of Canadian Court House usages. When 10 o'clock a. m. of the next day arrived, and the Court reassembled, Colonel Duggan suddenly and obligingly effected the release of himself and his tormentors by consenting to make the necessary modification in his opinion.—Of one characteristic scene we have a record in the books of the Court itself. On the 12th of January, 1813, as a duly impanelled jury were retiring to their room to consider of their verdict, a remark was addressed to one of their number, namely, Samuel Jackson, by a certain Simeon Morton, who had been a witness for the defence: the remark, as the record notes, was in these words, to wit, "Mind your eye!" to which the said Jackson replied "Never fear!" The Crier of the Court, John Bazell, duly made affidavit of this illicit transaction. Accordingly, on the appearance in court of the jury, for the purpose of rendering their verdict, Mr. Baldwin, attorney for the prosecution, moved that the said Jackson be taken into custody: and the Judge gave order "that Samuel Jackson do immediately enter into recognizances, himself in £50, and two sureties in £25 each, for his appearance on the Saturday following at the Clerk of the Peace Office, "which," as the record somewhat inelegantly adds, "he done." He duly appeared on the Saturday indicated, and, pleading ignorance, was discharged.

In the Court House in 1822 was tried a curious case in respect of a horse claimed by two parties, Major Heward of York and General Wadsworth, commandant of the United States Garrison at Fort Niagara. Major Heward had reared a sorrel colt on his farm east of the Don; and when it was three years old it was stolen. Nothing came of the offer of reward for its recovery until a twelvemonth after the theft, when a young horse was brought by a stranger to Major Heward at York and instantly recognized by him as his lost property. Some of the major's neighbours likewise had no doubt of the identity of the animal, which, moreover, when taken to the farm entered of its own accord the stable, and the stall, the missing colt used to occupy, and, when let out into the adjoining pasture, greeted in a friendly way a former mate, and ran to drink at the customary watering place. Shortly after, two citizens of the United States, Kelsey and Bond, make their appearances at York and claim the horse which they find on Major Heward's farm as the property of General Wadsworth, commandant at Fort Niagara. Kelsey swore that he had reared the animal; that he had docked him with his own hands when only a few hours old; and that he had sold him about a year ago to General Wadsworth. Bond also swore positively that this was the horse which Kelsey had reared, and that he himself had broken him in, prior to the sale to General Wadsworth. It was alleged by these persons that a man named Docksteader had stolen the horse from General Wadsworth at Fort Niagara and had conveyed him across to the Canadian side.

In consequence of the positive evidence of these two men the jury gave their verdict in favour of General Wadsworth's claim, with damages to the amount of £50. It was nevertheless generally held that Kelsey and Bond's minute narrative of the colt's early history was a fiction; and that Docksteader, the man who transferred the animal from the United States side of the river to Canadian soil, had also had something to do with the transfer of the same animal from Canada to the United States a twelvemonth previously.

The subject of this story survived to the year 1851, and was recognized and known among al old inhabitants as "Major Heward's famous Toby."

Within the Court House on Richmond Street took place in 1818 the celebrated trial of a number of prisoners brought down from the Red River Settlement on charges of "high treason, murder, robbery and conspiracy," as preferred against them by Lord Selkirk, the founder of the Settlement. When our neighbourhood was itself in fact nothing more than a collection of small isolated clearings, rough-hewn out of the wild, "the Selkirk Settlement" and "the North West" were household terms among us for remote regions in a condition of infinite savagery, in

omparison with which we, as we prided ourselves, were denizens of a paradise of high refinement and civilization. Now that the Red River district has attained the dignity of a province and become a member of our Canadian Confederation, the trial referred to, arising out of the very birth-throes of Manitoba, has acquired a fresh interest.

The Earl of Selkirk, the fifth of that title, was a nobleman of enlightened and cultivated mind. He was the author of several literary productions esteemed in their day; among them, of a treatise on Emigration, which is spoken of by contemporaries as an exhaustive, standard work on the subject. For practically testing his theories, however, Lord Selkirk appears to have desired a field exclusively his own. Instead of directing his fellow-countrymen to one or other of the numerous prosperous settlements already in process of formation at easily accessible and very eligible spots along the St. Lawrence and the Lakes Ontario, Erie and Huron, he induced a considerable body of them to find their way to a point in the far interior of our northern continent, where civilization had as yet made no sensible inroad; to a locality so situated that if a colony should contrive to subsist there, it must apparently of necessity remain for a very long period dismally isolated. In 1803, Bishop Macdonell asked him, what could have induced a man of his high rank and great fortune, possessing the esteem and confidence of the Government and of every public man in Britain, to embark in an enterprise so romantic; and the reply given was, that, in his opinion, the situation of Great Britain, and indeed of all Europe, was at that moment so very critical and eventful, that a man would like to have a more solid footing to stand upon, than anything that Europe could offer.—The tract of land secured by Lord Selkirk for emigration purposes was a part of the territory held by the Hudson's Bay Company, and was approached from Europe not so readily by the St. Lawrence route as by Hudson's Strait and Hudson's Bay. The site of the actual settlement was half-a-mile north of the confluence of the Assiniboine and Red Rivers, streams that unitedly flow northward into Lake Winnipeg, which communicates directly at its northern extremity with Nelson River, whose outlet is at Port Nelson or Fort York on Hudson's Bay. The population of the Settlement in the beginning of 1813 was 100. Mr. Miles Macdonell, formerly a captain in the Queen's Rangers, appointed by the Hudson's Bay Company first Governor of the District of Assiniboia, was made by the Earl of Selkirk superintendent of affairs at Kildonan. The rising village was called Kildonan, from the name of the parish in the county of Sutherland whence the majority of the settlers had emigrated.

The Montreal North West Company of Fur Traders was a rival of the Hudson's Bay Company. Whilst the latter traded for the most part in the regions watered by the rivers flowing into Hudson's Bay, the former claimed for their operations the area drained by the streams running into Lake Superior.

The North West Company of Montreal looked with no kindly eye on the settlement of Kildonan. An agricultural colony, in close proximity to their hunting grounds, seemed a dangerous innovation, tending to injure the local fur trade. Accordingly it was resolved to break up the infant colony. The Indians were told that they would assuredly be made "poor and miserable" by the new-comers if they were allowed to proceed with their improvements; because these would cause the buffalo to disappear. The Colonists themselves were informed of the better prospects open to them in the Canadian settlements, and were promised pecuniary help if they would decide to move. At the same time, the peril to which they were exposed from the alleged ill-will of the Indians was enlarged upon. Moreover, attacks with fire-arms were made on the houses of the Colonists, and acts of pillage committed. The result was that, in 1815, the inhabitants of Kildonan dispersed, proceeding, some of them, in the direction of Canada, and some of them northwards, purposing to make their way to Port Nelson, and to find, if possible, a conveyance thence back to the shores of old Scotland. Those, however, who took the northern route proceeded only as far as the northern end of Lake Winnipeg, establishing themselves for a time at Jack River House. They were then induced to return to their former settlement, by Mr. Colin Robertson, an agent of the Hudson's Bay Company, who assured them that a number of Highlanders were coming, via Hudson's Bay, to take up land at Kildonan. This proved to be the fact; and, in 1816, the revived colony consisted of more than 200 persons. On annoyance being offered to the settlement by the North West Company's agent, Mr. Duncan Cameron, who occupied a post called Fort Gibraltar, about half a mile off, Mr. Colin Robertson, with the aid of his Highlandmen, seized that establishment, and recovered two field-pieces and thirty stand of arms that had been taken

from Kildonan the preceding year. Cameron himself was also made a prisoner. (Miles Macdonell, governor of Assiniboia, had been captured by the same Cameron in the preceding year, and sent to Montreal.) A strong feeling was aroused among the half-breeds, far and near, who were in the interest of the North West Company. In the spring of 1816, Mr. Semple, the governor of the Hudson's Bay Company, appeared in person at the Red River, having been apprized of the growing troubles. During an angry conference, on the 18th of June, with a band of seventy men, headed by Cuthbert, Grant, Lacerte, Fraser, Hoole, and Thomas McKay, half-breed employés of the North West Company, he was violently assaulted; and in the meleé he was killed, together with five of his officers and sixteen of his people. Out of these events sprang the memorable trials that took place in the York Court House in 1818.

The Earl of Selkirk being desirous of witnessing the progress made by his emigrants at Red River, paid a visit to this continent in the autumn of 1815. On arriving at New York he heard of the dispersion at Kildonan, and the destruction of property there. He proceeded at once to Montreal and York to consult with the authorities. The news next reached him that his colony had been re-established, at least partially. He immediately despatched a trusty messenger, one Lagimoniere, with assurances that he himself would speedily be with them, bringing proper means of protection. But Lagimoniere was waylaid and never reached his destination.

It happened, about this time, in consequence of the peace just established with the United States, that the De Meuron, Watteville and Glengary Fencible Regiments were disbanded in the country. About eighty men of the De Meuron, with four of the late officers, twenty of the Watteville, and a few of the Glengary, with one of their officers, agreed to accompany Lord Selkirk to the Red River. On reaching the Sault, the tidings met the party of the second dispersion of the colony, and of the slaughter of Governor Semple and his officers. The whole band at once pushed on to Fort William, where were assembled many of the partners of the North West Company, with Mr. McGillivray, their principal Agent. Here were also some of the persons who had been made prisoners at Kildonan.

Armed simply with a commission of a Justice of the Peace, Lord Selkirk then and there, at his encampment opposite Fort William across the Kaministigoia, issued his warrant for the arrest of Mr. McGillivray.

It is duly served, and Mr. McGillivray submits. Two partners who came over with him as bail are also instantly arrested. The prisoners had been previously liberated and information was procured from them.

Warrants were then issued for the arrest of the remainder of the partners, who were found in the Fort. Some resistance was now offered. The gate of the Fort was partially closed by force; but a party of twenty-five men instantly rushed up from the boats and cleared the way into the Fort. At the signal of a bugle-call more men came over from the encampment, and their approach put an end to the struggle. The arrests were then completed, and the remaining partners were marched down to the boats. "At the time this resistance to the warrant was attempted there were," our authority informs us, "above 200 Canadians, *i.e.*, French, in the employment of the Company, in and about the Fort, together with 60 or 70 Iroquois Indians, also in the Company's service."

The Earl of Selkirk was plainly a man not to be trifled with; a chief who in lhe olden time, on the roughest emergency that might chance to present itself, would have been equal to the occasion.

The prisoners brought down from Fort William, and after the lapse of nearly two years placed at the Bar in the Old Court House of York, were arraigned as follows: "Paul Brown and F. F. Boucher, for the murder of Robert Semple, Esq., on the 19th of June, 1816. John Siveright, Alexander McKenzie, Hugh McGillis, John McDonald, John McLaughlin and Simon Fraser, as accessories to the same crime. Cooper and Bennerman, for taking, on the 3rd of April, 1815, with force and arms, eight pieces of cannon and one howitzer, the property of the Right Hon. Thomas Earl of Selkirk, from his dwelling house, and putting in bodily fear of their lives certain persons found therein." The cannons were further described as being two of them brass field-pieces, two of them brass swivels, four of them iron swivels. In each case the verdict was "not guilty."

The judges were Chief Justice Powell, Mr. Justice Campbell, Mr. Justice Boulton, and Associate Justice W. Allan, Esq. The counsel for the Crown were Mr. Attorney-General Robinson,

Mr. Solicitor-General Boulton. The counsel for the prisoners were Samuel Sherwood, Livius P. Sherwood, and W. W. Baldwin, Esq. The juries in the three trials were not quite identical. Those that served on one or other of them are as follows: George Bond, Joseph Harrison, Wm. Harrison, Joseph Shepperd, Peter Lawrence, Joshua Leach, John McDougall, jun., Wm. Moore, Alexander Montgomery, Peter Whitney, Jonathan Hale, Michael Whitmore, Harbour Stimpson, John Wilson, John Hough, Richard Herring.

The Earl of Selkirk was not present at the trials. He had proceeded to New York, on his way to Great Britain. He probably anticipated the verdicts that were rendered. The North-West Company influence in Upper and Lower Canada was very strong.

At a subsequent Court of Oyer and Terminer held at York a true bill against the Earl and nineteen others was found by the Grand Jury for "conspiracy to ruin the trade of the North-West Company;" Mr. Wm. Smith, Under-Sheriff of the Western District, obtained a verdict £500 damages for having been seized and confined by the said Earl" when endeavouring to serve a warrant on him in Fort William; and Daniel McKenzie, a retired partner of the North-West Company, obtained a verdict of £1,500 damages for alleged false imprisonment by the Earl in the same Fort.—Two years later, namely, in 1820, Lord Selkirk died at Pau, in the South of France.

XXXIII.—QUEEN STREET—FROM YONGE STREET TO TERAULAY STREET.

Leaving now the site of our ancient Court House, the spot at which we arrive in our tour is one of very peculiar interest. It is the intersection at right angles of the two great military ways carved out through the primitive forest of Western Canada by order of its first Governor. Dundas Street and Yonge Street were laid down in the first MS. maps of the country as highways destined to traverse the land in all future time, as nearly as practicable in right lines, the one from east to west, the other from south to north. They were denominated "streets," because their idea was taken from the famous ancient ways still in several instances called "streets," which the Romans, when masters of primitive Britain, constructed for military purposes. To this day it is no unpleasant occupation for the visitor who has leisure, to track out the lines of these ancient roads across England. We ourselves once made a pilgrimage expressly for the purpose of viewing the intersection of Iknield Street and Watling Street in the centre of Dunstable, and from our actual knowledge of what Canada was when its Yonge Street and Dundas Street were first hewn out, we realized all the more vividly the condition of central England when the Roman road-makers first began their work there.

Dundas Street has its name from the Right Hon. Henry Dundas, Secretary of State for the Colonies in 1794. In that year Governor Simcoe wrote as follows to Mr. Dundas: "Dundas Street, the road proposed from Burlington Bay to the river Thames, half of which is completed, will connect by an internal communication the Detroit and settlements at Niagara. It is intended, he says, to be extended northerly to York by the troops, and in process of time by the respective settlers to Kingston and Montreal." In another despatch to the same statesman he says: "I have directed the surveyer, early in the next spring to ascertain the precise distance of the several routes which I have done myself the honour of detailing to you, and hope to complete the Military Street or Road the ensuing autumn." In a MS. map of about the same date Dundas Street is laid down from Detroit to the Pointe au Bodet, the terminus on the St. Lawrence of the old boundary line between Upper and Lower Canada. From the Rouge River it is sketched as running somewhat further back than the line of the present Kingston Road; and after leaving Kingston it is drawn as though it was expected to follow the water-shed between the Ottawa and the St. Lawrence. A Road is sketched, running from the Pointe au Bodet to the Ottawa, and this Road is struck at an acute angle by Dundas Street. A manuscript note appears on the map, "The Dundas Street is laid out from Oxford to the Bay of Quinty: it is nearly finished from Oxford to Burlington Bay."

In 1799 the *Constellation*, a paper published at Niagara, informs us under the date of Friday, August 2nd, in that year, that "the wilderness from York to the Bay of Quinté is 120 miles; a road of this distance through it is contracted out by Government to Mr. Danforth, it informs its readers, to be cut and completed by the first of July next; and which when completed will open a communication round the Lake by land from this town [Niagara] with the Bay, Kingston,

&c. Hitherto, the *Constellation* continues, in the season of winter our intercourse with that part of the province has been almost totally interrupted. Mr. Danforth has already made 40 miles of excellent road, the editor encourages his patrons by saying, and procured men to the number sufficient for doing the whole extent by the setting in of winter. It would be desirable also, Mr. Tiffany suggests, were a little labour expended in bridging the streams between Burlington Bay and York: indeed the whole country, it is sweepingly declared, affords room for amendment in this respect."

It is plain from this extract that if the men of the present generation would have a just conception of what was the condition of the region round Lake Ontario seventy years ago, they must pay a visit to the head of Lake Superior and perform the journey by the Dawson-road and the rest of the newly opened route from Fort William to Winnipeg.

The road referred to above in the Niagara paper, as being about to be opened by Mr. Danforth in 1799, is still known as the Danforth Road. It runs somewhat to the north of the present Kingston Road, entering it by the town line at the "Four Mile Tree." Yonge Street, which we purpose duly to perambulate hereafter, has its name from Sir George Yonge, a member of the Imperial Government in the reign of George III. He was of a distinguished Devonshire family, and a personal friend of Governor Simcoe's.

The first grantee of the park-lot which we next pass in our progress westward was Dr. Macaulay, an army surgeon attached successively to the 33rd Regiment and the famous Queen's Rangers. His sons, Sir James Macaulay, first Chief Justice of the Common Pleas, and Colonel John Simcoe Macaulay, a distinguished officer of Engineers, are well remembered. Those who have personal recollections of Dr. Macaulay speak of him in terms of great respect. The southern portion of this property was at an early period laid out in streets and small lots. The collection of houses that here began to spring up was known as Macaulay Town, and was long considered as bearing the relation to York that Yorkville does to Toronto now. So late as 1833 Walton in his Street Guide and Register speaks of Macaulay Town as extending from Yonge Street to Osgoode Hall.

James Street retains the Christian name of Dr. Macaulay. Teraulay Street led up to the site of his residence, Teraulay Cottage, which after having been moved from its original position in connection with the laying out of Trinity Square off Yonge Street, was destroyed by fire in 1848. The northern portion of Macaulay Town was bounded by Macaulay Lane, described by Walton as "fronting the fields." This was Louisa Street.

Of the memorable possessor of the property on the south side of Queen Street opposite Macaulay Town, Mr. Jesse Ketchum, we shall have occasion to speak hereafter, when we pass his place of abode in our proposed journey through Yonge Street. The existing Free Kirk place of worship, known as Knox's Church, stands on land given by Mr. Ketchum, and on a site previously occupied by a lone oblong red brick chapel which looked towards what is now Richmond Street, and in which a son-in-law of his, Mr. Harris, officiated to a congregation of United Synod Presbyterians. The donor was probably unconscious of the remarkable excellence of this particular position as a site for a conspicuous architectural object. The spire that towers up from this now central spot is seen with peculiarly good effect as one approaches Toronto by the thoroughfare of Queen Street whether from the east or from the west.

XXII.—QUEEN STREET—DIGRESSION SOUTHWARD AT BAY STREET.

Old inhabitants say that Bay Street, where we are now arrived, was at first in fact "Bear Street," and that it was popularly so called from a noted chase given to a bear out of the adjoining wood on the north, which, to escape from its pursuers, made for the water along this route. Mr. Justice Boulton's two horses, Bonaparte and Jefferson, were once seen, we are told, to attack a monster of this species that intruded on their pasture on the Grange property a little to the west. They are described as plunging at the animal with their fore feet. In 1809, a straggler from the forest of the same species was killed in George Street by Lieut. Fawcett of the 100th regiment, who cleft the creature's head open with his sword. This Lieut. Fawcett was afterwards Lieut. Col. of the 100th, and was severely wounded in the war of 1812.

Bay Street, as we pass it, recalls one of the early breweries of York. We have already in another place briefly spoken of Shaw's and Hugill's. At the second north-west corner south-

ward, beer of good repute in the town and neighbourhood was manufactured by Mr. John Doel up to 1847, when his brewery was accidentally burnt. Mr. Doel's name is associated with the early post-office traditions of York. For a number of years he undertook and faithfully accomplished the delivery with his own hands of all the correspondence of the place that was in those days thus distributed. His presence at a door in the olden time was often a matter of considerable interest. In the local commotions of 1837, Mr. Doel ventured in an humble way to give aid and comfort to the promoters of what proved to be a small revolution. We cannot at this hour affirm that there was any thing to his discredit in this. He acted, no doubt, in accordance with certain honest instincts. Men of his class and stamp, shrewd in their ideas and sturdy against encroachments, civil and religious, abound in the old Somersetshire, where he first drew breath. His supposed presumption in having opinions on public questions induced the satirists of the non-progressive side to mention him occasionally in their philippics and pasquinades. His name has thus become associated in the narrative of Upper Canadian affairs with those of the actual chiefs of the party of reform. In 1827, Robert Randal, M.P., was despatched to London as a delegate on the part of the so-called "Aliens'" or unnaturalized British subjects of United States origin. A series of burlesque nominations, supposed to be suggested by Randal to the Colonial Secretary, appeared at this time, emanating of course from the friends of the officials of the day. We give the document. It will be seen that Mr. Doel is set down in it for the "Postmaster-Generalship." The other persons mentioned will be all remembered.

"Nominations to be dictated by the Constitutional Meeting, on Saturday next, in the petition for the redress of grievances to be forwarded to London by Ambassador Randal. Barnabas Bidwell—President of Upper Canada—with an extra annual allowance for a jaunt, for the benefit of his health, to his native State of Massachusetts. W. W. Baldwin—Chief Justice, and Surgeon-General to the Militia Forces—with 1,000,000 acres of land for past services, he and his family having been most shamefully treated in having grants of land withheld from them heretofore. John Rolph—Attorney-General, and Paymaster-General to the Militia—with 500,000 acres of land for his former accounts as District Paymaster, faithfully rendered. Marshall S. Bidwell—Solicitor-General—with an annual allowance of as much as he may be pleased to ask for, rendering no account—for the purpose of "encouraging emigration from the United States," and a contingent account if he shall find it convenient to accompany the President to Massachusetts. The Puisne Judges—to be chosen by ballot in the Market Square, on 4th July in each and every year, subject to the approval of W. W. B., the Chief Justice. Their salaries to be settled when going out of office. Jesse Ketchum, Jos. Sheppard, Dr. Stoyell, and A. Burnside—Executive and Legislative Councillors. Joint Secretaries—William Lyon McKenzie and Francis Collins, with all the printing. John Carey—Assistant Secretary, with as much of the printing as the Joint Secretaries may be pleased to allow him. Moses Fish — Inspector of Public Buildings and Fortifications. J. S. Baldwin—Contractor-General to the Province, with a monopoly of the trade. T. D. Morrison—Surveyor-General, and Inspector of Hospitals. Little Doel — Postmaster-General. Peter Perry—Chancellor of the Exchequer and Receiver-General. The above persons being thus amply provided for, their friends, alias their stepping stones, the document just quoted proceeds to state, may shift for themselves; an opportunity, however, will be offered them for 'doing a little business' by disposing of all other public offices to the lowest bidder, from whom neither talent nor security will be required for the performance of their duties. Tenders received at Russell Square [Abbey], Front Street, York. The Magistracy, being of no consequence, is to be left for after consideration. The Militia, at the particular request of Paul Peterson [Peter Paterson], to be done away altogether; and the roads to take care of themselves. The Welland Canal to be stopped immediately,' and Colonel By to be recalled from the Rideau Canal. N.B. Any suggestions for further *improvements* will be thankfully received at Russell Square, as above."

Mr. Doel arrived in York in 1818, occupying a month in the journey from Philadelphia to Oswego, and a week in that from Oswego to Niagara, being obliged from stress of weather to put in at Sodus Bay. At Niagara he waited three days for a passage to York. He and his venerable helpmeet were surviving in 1870, at the ages respectively of 80 and 82. Not without reason, as the event proved, they lived for many years in a state of apprehension in regard to

the stability of the lofty spire of a place of worship close to their residence. In 1862, that spire actually fell, eastward as it happened, and not westward, doing considerable damage. Mr. Doel died in 1871.

By the name of the short street passing from Adelaide Street to Richmond Street, a few chains to the west of Mr. Doel's corner, we are reminded of Harvey Shepard, a famous worker in iron of the former time, whose imprint on axe, broad axe or adze, was a guarantee to the practical backwoodsman of its temper and serviceable quality. Harvey Shepard's axe factory was on the west side of this short street. Before his establishment here, he worked in a stithy of the customary village type, on King Street, on the property of Jordan Post. Like Jordan Post himself, Harvey Shepard was of the old fashioned New England mould, elongated and wiry. After a brief suspension of business, a placard hung up in the country inns characteristically announced to his friends and the public that he had resumed his former occupation and that he would, "by the aid of Divine Providence," undertake to turn out as good axes as any that he had ever made; which acknowledgment of the source of his skill is commendable surely, if unusual. So also, there is no one who will refuse to applaud an epigrammatic observation of his, when responding to an appeal of charity. "Though dealing usually in iron only, I keep," he said, "a little stock of silver and gold for such a call as this." The factory on Shepard Street was afterwards worked by Mr. J. Armstrong, and subsequently by Mr. Thos. Champion, formerly of Sheffield, who, in 1838, advertised that he had "a large stock of Champion's warranted cast steel axes, made at the factory originally built by the late Harvey Shepard, and afterwards occupied by John Armstrong. As Shepard's and Armstrong's axes have been decidedly preferred before any others in the Province, the advertisement continues, it is only necessary to state that Champion's are made by the same workmen, and from the very best material, to ensure for them the same continued preference."

XXXV.—QUEEN STREET—TERAULAY STREET TO OSGOODE HALL.

Chief Justice Elmsley was the first possessor of the hundred acres westward of the Macaulay lot. He effected, however, a certain exchange with Dr. Macaulay. Preferring land that lay higher, he gave the southern half of his lot for the northern half of his neighbour's, the latter at the same time discerning, as is probable, the prospective greater value of a long frontage on one of the highways into the town. Of Mr. Elmsley, we have had occasion to speak in our perambulation of King Street in connexion with the Government House, which in its primitive state was his family residence; and in our progress through Yonge Street hereafter we shall again have to refer to him. In 1802 he was promoted from a Puisne Judgeship in Upper Canada to the Chief Justiceship of Lower Canada.

The park-lot which follows was originally secured by one who has singularly vanished out of the early traditions of York—the Rev. T. Raddish. His name is inscribed on this property in the first plan, and also on part of what was afterwards Russel Square. He emigrated to these parts under the express auspices of the first Lieutenant Governor, and was expected by him to take a position of influence in the young colony of Upper Canada. But, habituated to the amenities and conveniences of an old community, he speedily discovered either that an entirely new society was not suited to him or that he himself did not dovetail well into it. He appears to have remained in the country only just long enough to acquire for himself and heirs the fee simple of a good many acres of its virgin soil. In 1826 the southern portion of Mr. Raddish's lot became the property of Sir John Robinson, at the time Attorney General. The site of Osgoode Hall, six acres, was the generous gift of Sir John Robinson to the Law Society, and the name which the building bears was his suggestion. The east wing of the existing edifice was the original Osgoode Hall, erected under the eye of Dr. W. W. Baldwin, at the time Treasurer of the Society. It was a plain square matter-of-fact brick building two storeys and a half in height. In 1844–46 a corresponding structure was erected to the west, and the two were united by a building between, surmounted by a low dome. In 1857–60 the whole edifice underwent a renovation; the dome was removed; a very handsome façade of cut stone was put up; the inner area, all constructed of Caen stone, reminding one of the interior of a Genoese or Roman Palace, was added, with the Court Rooms, Library and other appurtenances, on a scale of dignity and in a style of architectural beauty surpassed only by the new Law Courts

in London. The pediment of each wing, sustained aloft on fluted Ionic columns, seen on a fine day against the pure azure of a northern sky, is something enjoyable. Great expense has been lavished by the Benchers on this Canadian *Palais de Justice;* but the effect of such a pile, kept in its every nook and corner and in all its surroundings in scrupulous order, is invaluable, tending to refine and elevate each successive generation of our young candidates for the legal profession, and helping to inspire amongst them a salutary esprit de corps. The Library, too, here to be seen, noble in its dimensions and aspect, must, even independently of its contents, tend to create a love of legal study and research. The Law Society of Osgoode Hall was incorporated in 1822. The Seal bears a Pillar on which is a Beaver holding a Scroll inscribed MAGNA CHARTA. To the right and left are figures of Justice and Strength (Hercules).

An incident associated in modern times with Osgoode Hall is the Entertainment given there to the Prince of Wales during his visit to Canada in 1860, on which occasion, at night, all the architectural lines of the exterior of the building were brilliantly marked out by long rows of minute gas-jets.

Here, too, were held the impressive funeral obsequies of Sir John Robinson, the distinguished Chief Justice of Upper Canada, in 1862. In the library is a large painting of him in oil, in which his finely cut Reginald Heber features are well delineated. Sayer Street, passing northward on the east side of Osgoode Hall, was so named by Chief Justice Robinson in honour of his mother. In 1870 the name was changed, probably without reflection and certainly without any sufficient cause.

The series of paintings begun in Osgoode Hall, conservative to future ages of the outward presentment of our Chief Justices, Chancellors and Judges, is very interesting. No portrait of Chief Justice Osgoode, however, is here to be seen. It may be satisfactory to know that one in oil exists in the collection of Capt. J. K. Simcoe, R. N., at Wolford Lodge in the County of Devon. After filling the office of Chief Justice in Upper Canada Mr. Osgoode was removed to the same high position in Lower Canada. He resigned in 1801 and returned to England. Among the deaths in the *Canadian Review* of July, 1824, his is recorded in the following terms: "At his Chambers in the Albany, London, on the 17th of February last, Wm. Osgoode, Esq., formerly Chief Justice of Canada, aged 70. By the death of this gentleman, it is added, his pension of £800 steriing paid by this Province now ceases." It is said of him "no person admitted to his intimacy ever failed to conceive for him that esteem which his conduct and conversation always tended to augment." Garneau, in his History of Canada, iii, 117, without giving his authority, says that he was an illegitimate son of George III. Similar tattle has been rife from time to time in relation to other personages in Canada.

A popular designation of Osgoode Hall long in vogue was "Lawyers' Hall:"

> "Farewell, Toronto, of great glory,
> Of valour too, in modern story;
> Farewell to Courts, to Lawyers' Hall,
> To Justice seats, both great and small:
> Farewell Attornies, Special Pleaders,
> Equity Draftsmen, and their Readers.
> Canadian Laws, and Suits, to song
> Of future Bard, henceforth belong."

Thus closed a curious production in rhyme entitled *Curiæ Canadenses*, published anonymously in 1843, but written by Mr. John Rumsey, an English barrister, sometime domiciled here. In one place is described the migration of the Court of Chancery back from Kingston, whither it was for a brief interval removed, when Upper and Lower Canada were reunited. The minstrel says:

> "Dreary and sad was Frontenac:
> Thy duke ne'er made a clearer sack,
> Than when the edict to be gone
> Issued from the Vice-regal Throne.
> *Exeunt omnes*, helter skelter
> To Little York again for shelter:
> Little no longer: York the New
> Of imports such can boast but few:
> A goodly freight, without all brag,
> When comes, 'mongst others, Master Spragge,
> And skilful Turner, versed in pleading,
> The Kingston exiles gently leading."

To the last three lines the following notes are appended:

J. G. Spragge, Esq., the present very highly esteemed and respected Master of the Court of Chancery, R. J. Turner, Esq., a skilful Equity Draftsman and Solicitor in Chancery. See *Journals of House of Assembly*, 1841."

The notes to *Curiæ Canadenses* teem with interesting matter relating to the laws, courts, erms, districts and early history, legal and general, of Lower as well as Upper Canada. A copious table of contents renders the volume quite valuable for reference. The author must have been an experienced compiler, analyst, and legal index maker. In the text of the work, Christopher Anstey's poetical "Pleader's Guide" is taken as a model. As a motto to the portion of his poem that treats of Upper Canada he places the line of Virgil, "*Gensque virum truncis et duro robore nata*," which may be a compliment or not. The title in full of Mr. Rumsey's brochure, which consists of only 126 octavo pages, is as follows: "CURIÆ CANADENSES; or, THE CANADIAN LAW COURTS: being a Poem, describing the Several Courts of Law and Equity which have been erected from time to time in the Canadas; with copious notes, explanatory and historical, and an Appendix of much useful Matter. Itur in antiquam Sylvam, stabula alta ferarum; Procumbunt piceæ, sonant icta securibus ilex, Fraxineæque trabes: cuneis et fissile robur Scinditur: advolvunt ingentes montibus ornos.—*Virgil*. By PLINIUS SECUNDUS. Toronto: H. & W. Rowsell, King Street, 1843." The typography and paper are admirable. The *Curiæ*, in a jacket of fair calf, should be given a place on the shelves of our Canadian law-libraries.

XXXVI.—QUEEN STREET—YORK STREET.

It rather puzzles one to conceive why York Street received that name. If a commemoration of the Duke of York of sixty years since was designed, the name of the whole town was that sufficiently already. Frederick Street, besides, recorded his specific Christian name, and Duke Street his rank and title. Although interesting now as a memento of a name borne of old by Toronto, York Street, when Toronto was York, might well have been otherwise designated, it seeming somewhat irrational for any particular thoroughfare in a town to be distinguished by the name of that town.—A certain poverty of invention in regard to street names has in other nstances been evinced amongst us. Victoria Street, for example, was for a time called Upper George Street, to distinguish it from George Street proper, so named from George, Prince of Wales, the notable Prince Regent. It is curious that no other name but George should have been suggested for the second street; especially too as that street might have been so fittingly named Toronto Street, as being situated within a few feet of the line of the original thoroughfare of that name which figures so largely in the early descriptions of York.—If in "York Street" a compliment had been intended to Charles Yorke, Secretary at War in 1802, the orthography would have been "Yorke Street."

After all, however, the name "York Street" may have arisen out of the circumstance that, at an early period, this was for teams on their way to York, the beaten track, suddenly turning off here to the south out of the line of Dundas or Lot Street, which, if followed, would take the traveler to Kingston.

The street on the west of the grounds of Osgoode Hall is now known as University Street. By the donor to the public of the land occupied by the street, it was designated Park Lane—not without due consideration, as is likely. In London there is a famous and very distinguished Park Lane. It leads from Oxford Street to Piccadilly, and skirts the whole of the east side of Hyde Park. The position of what was our Park Lane is somewhat analogous, it being open along its whole length on the left to the plantation of an ornamental piece of ground. Unmeddled with, our Park Lane would have suggested from time to time in the mind of the ruminating wayfarer pleasant thoughts of a noble and interesting part of the great home metropolis. The change to University Street was altogether uncalled for. It ignored the adjoining "College Avenue," the name of which shewed that a generally recognized "University Street" existed already: it gave moreover a name which is pretentious, inasmuch as the roadway indicated is comparatively narrow.

Of the street on the east side of the grounds of Osgoode Hall we have already spoken. But in connexion with the question of changes in street names, we must here again refer to it.

What particular advantage was secured, we may ask, by altering the name of that street from "Sayer" to "Chestnut?" As a name imposed by the donor of the land, commemorative of a name which he desired in perpetuity to honour, the appellation "Sayer" should have been respected.

It is unfortunate when persons, apparently without serious retrospective thought, apparently without sympathy with the local past, have a momentary chance to make changes of this kind, Chancery might well be invoked to undo in some instances what has been done, and to prohibit like inconsiderate doings in the future. Equity would surely say that a citizen's private right should not be infringed, so long as it worked no harm to the community, and that perplexity in the registration and description of property should not needlessly be created.

And again, if it was deemed necessary to obliterate "Sayer," why, in particular, was "Chestnut" selected as the new designation? The street, now so named, is in no way remarkable for trees yielding that esculent. The name of the donor of the land would have been less objectionable. "Elm Street," which intersects this street to the north, probably in some vague way suggested a tree-name. "Elm Street," however, might better have suggested the propriety of regulating the imposition of street names by a principle. The name "Elm street" had a reason for its existence. Many persons still remember a solitary Elm, a relic of the forest, which was long conspicuous just where Elm Street enters Yonge Street.

As to Pine Street and Sumach Street in the east: there is a fitness also in their names, for these streets pass through a region where, as is still remembered, pines and sumachs abounded.

[Since the writing of our xxviith section, the name of "McMahon Street" has been superseded by that of "Ontario Street"—a thoroughfare that is now supposed to extend to Yorkville. At the same time, by way of compensation perhaps, the name of "Sherbourne Street" is made to supersede that of "Caroline Street," down to the water's edge. "Caroline Street," as we have seen in Section i. of these papers, had a good old historic significance; and, accordingly, it should not have been lightly blotted out. In view of the origin of the name (see Section xxviii.), "Sherbourne," as applied to what was Caroline Street, especially in its lower portion, is altogether without point or meaning. It simply serves to difference the street from other streets; and the name "Caroline" did that already.—Note, that the site of Mr. McMahon's residence was on a portion—not of the Small park-lot, as stated in Section xxvii., but—of the adjoining White park-lot.—Note also, that towards the end of Section vi., "Baty," copied from Liancourt, should be "Berzey;" likewise that in Section viii., "Lord Stanley" should be "Lord Derby."]

Although by so doing we shall forestall ourselves a little, we shall here say what we have to say in regard to another change in a street name near Osgoode Hall. William Street, immediately west of the Avenue leading to the University, has in recent times been changed to Simcoe Street. It is true, William Street was nearly in a line with Simcoe Street; nevertheless, starting as it conspicuously did somewhat to the west of that line on the north side of a great intersecting thoroughfare, it was a street sufficiently distinct to be entitled to retain an independent name. Here again, an item of local history has been obscured by the change. William Street was a record on the soil of the first name of an early Chief Justice of Upper Canada, who projected the street and gave the land. Dummer Street, the next street westward, bears his second name. Of "Powell," his third name, we have already elsewhere spoken, and which again almost immediately have to speak. [Note, that an excellent portrait of Chief Justice Powell exists in the possession of his descendants in Toronto, but not in Osgoode Hall, as was stated in Section ix. of these papers.]

When the proposal comes up for an alteration in "Dummer Street," with the hope perhaps of improving its fame along with its name, let the history of March Street be recalled. In the case of March Street, the rose, notwithstanding a change of name, retained its perfume: and the Colonial Minister of the day, Lord Stanley, received but a sorry compliment when his name was made to displace that of the Earl of March. (It was from this second title of the Duke of Richmond that March Street had its name.) It is probable that the Dummer Street of to-day, like the March Street of yesterday, would, under another name, continue much the same. In all such localities, it is not a change of name that avails: but the presence of the schoolmaster and home-missionary, backed up by landlords and builders possessed of reasonable ideas in regard to matters sanitary as well as monetary.

XXXVII.—QUEEN STREET—THE COLLEGE AVENUE AND PARK.

The fine vista of the College Avenue, opposite to which we have now arrived, always recalls to our recollection a certain bright spring morning, when on reaching school a whole holiday was unexpectedly announced; and when, as a mode of filling up a portion of the unlooked-for vacant time, it was agreed between two or three young lads to pay a visit to the place on Lot Street where, as the report had spread amongst us, they were beginning to make visible preparations for the commencement of the University of King's College. The minds of growing lads in the neighbourhood of York at that period had very vague ideas of what a University really was. It was a place where studies were carried on, but how or under what conditions, there was of necessity little conception. Curiosity, however, was naturally excited by the talk on the lips of every one that a University was one day to be established at York; and now suddenly we learned that actual beginnings were to be seen of the much-talked-of institution. On the morning of the fine spring day referred to, we accordingly undertook an exploration.

On arriving at the spot to which we had been directed, we found that a long strip of land running in a straight line northwards had been marked out, after the manner of a newly-opened side line or concession line in the woods. We found a number of men actually at work with axes and mattocks; yokes of oxen, too, were straining at strong ploughs, which forced a way in amongst the roots and small stumps of the natural brushwood, and, here and there, underneath a rough mat of tangled grass, bringing to light, now black vegetable mould, now dry clay, now loose red sand. Longitudinally, up the middle of the space marked off, several bold furrows were turned up, those on the right inclining to the left, and those on the left inclining to the right, as is the wont in primitive turnpiking.

One novelty we discovered, viz., that on each side along a portion of the newly cleared ground, young saplings had been planted at regular intervals; these, we were told, were young horse-chestnuts, procured from the United States, expressly for the purpose of forming a double row of trees here. In the neighbourhood of York the horse-chestnut was then a rarity.

Everywhere throughout the North American continent, as in the numerous newly-opened areas of the British Empire elsewhere on the globe's surface, instances, of course, abound of wonderful progress made in a brief interval of time. For ourselves, we seem sometimes as if we were moving among the unrealities of a dream when we deliberately review the steps in the march of physical and social improvement, which, within a fractional portion only of a range of recollections not so very extended, can be recalled, in the region where our own lot has been cast, and, in particular in the neighbourhood where we are at this moment pausing.

The grand mediæval-looking structure of University College in the grounds at the head of the Avenue, continues to this day to be a surprise somewhat bewildering to the eye and mind, whenever it breaks upon the view. It looks so completely a thing of the old world and of an age long past away. To think that one has walked over its site before one stone was laid upon another thereon, seems almost like a mental hallucination. A certain quietness of aspect and absence of overstrain after architectural effect give the massive pile an air of great genuineness. The irregular grouping of its many parts appears the undesigned result of accretion growing out of the necessities of successive years. The whole looks in its place, and as if it had long occupied it. The material of its walls, left for the most part superficially in the rough, has the appearance of being weather-worn. An impression of age too is given by the smooth finish of the surrounding grounds and spacious drives by which, on several sides, the building is approached, as well as by the goodly size of the well-grown oaks and other trees through whose outstretched branches it is usually first caught sight of, from across the picturesque ravine. Of the still virgin condition of the surrounding soil, however, we have some unmistakeable evidence in the ponderous granitic boulders every here and there heaving up their gray back above the natural greensward, undisturbed since the day when they dropped suddenly down from the dissolving ice-rafts that could no longer endure their weight. Seen at a little distance, as from Yonge Street for example, the square central tower of the University, with the cone-capped turret at one of its angles, rising above a pleasant horizon of trees, and outlined against an afternoon sky, is something thoroughly English, recalling Rugby or Warwick. On a nearer approach, this same tower, combined with the portal below, bears a certain resemblance to the gateway of the Abbey of Bury St. Edmunds, as figured in Palsgrave's "Anglo-Saxons;" and the

elaborate and exquisite work about the recessed circular-headed entrance enables one to realize with some degree of certainty how the enriched front of that and other noble medieval structures, seen by us now corroded and mutilated, looked when fresh from the hands that so cunningly carved them. In the two gigantic blind-worms, likewise, stretched in terrorem, on the sloping parapets of the steps leading to the door, benumbed, not dead; giving in their extremities, still faint evidence of life, we have a sermon in stone, which the brethren of a masonic guild of Wykeham's day would readily have expounded. As we enter a house devoted to learning and study, is it not fitting that the eye should be greeted with a symbol of the paralyzing power of Science over Ignorance and Superstition?

Moreover sounds that come at stated intervals from that central tower, make another link of sympathy with the old motherland. Every night at nine, "swinging slow with solemn roar" the great bell of the University is agreeably suggestive of Christ Church, Oxford, St. Mary's, Cambridge, and other places beyond the sea, which to the present hour give back an echo of the ancient Curfew.—And if to this day the University building, in its exterior aspect and accidents, is startling to those who knew its site when as yet in a state of nature, its interior also, when traversed and explored, tends in the same persons to produce a degree of confusion as between things new and old; as between Canada and elsewhere. Within its walls are to be seen appliances and conveniences and luxuries for the behoof and use of teacher and student, unknown a few years since in many an ancient seat of learning. In a library of Old World aspect and arrangement, is a collection rich and recherché in the Greek and Latin Classics, in Epigraphy and Archæology, beyond anything of the kind in any other collection on this continent, and beyond what is to be met with in those departments in many a separate College within the precincts of ancient Universities—a pre-eminence due to the tastes and special studies of the first president and other early professors of the Canadian Institution. Strange, it is, yet true, that hither, as to a recognized source of indispensable aid in identification and decipherment, are duly transmitted by cast, rubbing and photograph, the "finds" that from time to time create such excitement and delight among the epigraphists, and ethnologists, the minute historical investigators, archæologists, and craniologists, of the British Islands and elsewhere.

The original architectural design for the great educational institution to which the Avenue was intended to be an approach, was a very curious one. A model of it on a large scale, cut out in cork, wood and card-board used to be preserved in the Old Hospital. If it had been carried into effect a large portion of the park provided for the reception of the University would have been covered with buildings. A multitude of edifices, isolated and varying in magnitude, were scattered about, with gardens and ornamental grounds interspersed. These were halls of science, lecture-rooms, laboratories, residences for president, vice-president, professors, officials and servants of every grade. On the widely-extended premises occupied by the proposed institution, a population was apparently expected to be found that would have sufficed to justify representation in Parliament—a privilege the college was actually by its charter to enjoy. We should have had in fact realized before our eyes, on a considerable scale, a part of the dreams of Plato and More, a fragment of Atlantis and Utopia.

When the moment arrived, however, for calling into visible being the long-contemplated seat of learning, it was found expedient to abandon the elaborate model which had been constructed. Mr. Young, a local architect, was directed to devise new plans. His ideas appear to have been wholly modern. Notwithstanding the tenor of the Royal Charter, which suggested the precedents of the old universities of "our United Kingdom of Great Britain and Ireland," wherever practicable to be followed, the architecture and arrangements customary in those places were ignored. Girard College, Philadelphia, seems to have inspired the idea of the new designs. Happily only a minute angle of one of the buildings of the new plan was destined ever to exist. The formal commencement of the abortive work took place on the 23rd of April, 1842—a day indelibly impressed on the memory of those who participated in the proceedings.—It was one of the sunniest and brightest of days. In the year just named it happened, that so early as St. George's day the leaves of the horse-chestnut were bursting their glossy sheaths, and the vegetation generally was in a very advanced stage. A procession, such as had never before been seen in these parts, slowly defiled up the Avenue to the spot where the corner-stone of the proposed University was to be laid.

A high-wrought contemporary description of the scene is given in a note in *Curiæ Canadenses*, "The vast procession opened its ranks, and his Excellency, the Chancellor, with the President,

the Lord Bishop of Toronto, on his right, and the Senior Visitor, the Chief Justice, on his left, proceeded on foot through the College Avenue to the University grounds. The countless array moved forward to the sound of military music. The sun shone out with cloudless meridian splendour, one blaze of banners flashed upon the admiring eye.—The Governor's rich Lord Lieutenant's dress, the Bishop's sacredotal robes, the Judicial Ermine of the Chief Justice, the splendid Convocation robes of Dr. McCaul, the gorgeous uniforms of the suite, the accoutrements of the numerous Firemen, the national badges worn by the Office-bearers of the different Societies, and what on such a day (St. George's) must not be omitted, the Red Crosses on the breasts of England's congregated sons, the grave habiliments of the Clergy and Lawyers, and the glancing lances and waving plumes of the First Incorporated Dragoons, all formed one moving picture of civic pomp, one glorious spectacle which can never be remembered but with satisfaction by those who had the good fortune to witness it. The following stanza from a Latin Ode," the note goes on to say, "recited by Master Draper, son of the late Attorney General, after the ceremony, expresses in beautifully classical language the proud occasion of all this joy and splendid pageantry :

"Io! triumphe! flos Canadensium!
Est alma nobis mater; æmula
Britanniæ hæc sit nostra terra,—
Terra diu domibus negata!"

Another contemporary account adds: "As the procession drew nearer to the site where the stone was to be laid, the 43rd Regiment lined the way, with soldiers bearing arms and placed, on either side, at equal intervals. The 93rd regiment was not on duty here, but in every direction the gallant Highlanders were scattered through the crowd, and added by their national garb and nodding plumes to the varied beauty of the animated scene. When the site was reached," this account says, "a new feature was added to the interest of the ceremony. Close to the spot, the north-east corner, where the foundation was to be deposited, a temporary building had been erected for the Chancellor, and there, accompanied by the officers of the University and his suite, he took his stand. Fronting this was a kind of amphitheatre of seats, constructed for the occasion, tier rising above tier, densely filled with ladies, who thus commanded a view of the whole ceremony. Between this amphitheatre and the place where the Chancellor stood, the procession ranged itself."

The Chancellor above spoken of was the Governor General of the day, Sir Charles Bagot, a man of noble bearing and genial, pleasant aspect. He entered with all the more spirit into the ceremonies described, from being himself a graduate of one of the old universities. Memories of far-off Oxford and Christ Church would be sure to be roused amidst the proceedings that rendered the 23rd of April, 1842, so memorable amongst us. A brother of Sir Charles' was at the time Bishop of Oxford. In his suite, as one of his Secretaries, was Captain Henry Bagot, of the Royal Navy, his own son. Preceding him in the procession, bearing a large gilded mace, was an "Esquire Bedell," like the Chancellor himself, a Christ Church man, Mr. William Cayley, subsequently a member of the Canadian Government.

Although breaking ground for the University building had been long delayed, the commencement now made proved to be premature. The edifice begun was never completed, as we have already intimated; and even in its imperfect, fragmentary condition, it was not fated to be for any great length of time a scene of learned labours. In 1856 its fortune was, to be converted into a Female Department for the over-crowded Provincial Lunatic Asylum.

The educational system inaugurated in the new building in 1843, was, as the plate enclosed in the foundation-stone finely expressed it, "præstantissimum ad exemplar Britannicarum Universitatum." But the "exemplar" was not, in practice, found to be, as a whole, in harmony with the genius of the Western Canadian people. (In truth, the same "exemplar," as constituted in 1842, was pronounced not long afterwards out of harmony with the genius of modern Britain itself.)

The revision of the University scheme for Upper Canada with a view to adapting it to the wants of the Western Canadian people, was signalized by the erection in 1857 of a new building on an entirely different site, and a migration bodily of president, professors and students to it, continuing however still within the limits of the spacious park originally provided for the

institution; and it is remarkable that, while departing educationally and otherwise, in some points, from the exemplar of the ancient universities, as they were in 1842, a nearer approach, architecturally, was made to the medieval English College than any that had been thought of before. Mr. Cumberland, the designer of the really fine and most appropriate building in which the University at length found a resting place, was imbued, as is evident, with a large measure of the spirit of Wykeham and Wayneflete.

The story of our University is a part of the history of Upper Canada. From the first foundation of the colony the idea of some such seat of learning entered into the scheme of its organization. In 1791 before he had yet left England for the unbroken wilderness in which his Government was to be set up, we have General Simcoe speaking to Sir Joseph Banks, the President of the Royal Society, of "a college of a higher class," as desirable in the community which he was about to create. "A college of a higher class," he says, "would be eminently useful, and would give a tone of principles and of manners that would be of infinite support to Government." In the same letter he remarks to Sir Joseph, "My friend the Marquis of Buckingham has suggested that Government might allow me a sum of money to be laid out for a Public Library, to be composed of such books as might be useful in the colony. He instanced the Encyclopedia, extracts from which might occasionally be published in the newspapers. It is possible," he adds, "private donations might be obtained, and that it would become an object of Royal munificence."

It was naturally long before the community of Upper Canada was ripe for a college of the character contemplated; but provision for its ultimate existence and sustenance was made, almost from the beginning, in the assignment to that object of a fixed and liberal portion of the public lands of the country.—In 1819–20, Gourlay spoke of the unpreparedness of Upper Canada as yet for a seat of learning of a high grade. Meanwhile, as a temporary expedient, he suggested a romantic scheme. "It has been proposed," he says, "to have a College in Upper Canada; and no doubt in time colleges will grow up there. At present, and for a considerable period to come, any effort to found a College would prove abortive. There could neither be got masters nor scholars to ensure a tolerable commencement for ten years to come; and a feeble beginning might beget a feeble race of teachers and pupils. In the United States," he continued, "academies and colleges, though fast improving, are yet but raw; and greatly inferior to those in Britain, generally speaking. Twenty-five lads sent annually at public charge from Upper Canada to British Universities, would draw after them many more. The youths themselves, generally, would become desirous of making a voyage in quest of learning.—Crossing the ocean on such an errand, would elevate their ideas, and stir them up to extraordinary exertions. They would become finished preachers, lawyers, physicians, merchants; and returning to their native country would repay in wisdom what was expended in goodness and liberality. What more especially invites the adoption of such a scheme, is the amiable and affectionate connexion which it would tend to establish between Canada and Britain. But it will not do at present to follow out the idea." His prediction that "in time colleges will grow up there" has been speedily verified. The town especially, of which in its infant state, he spoke in such terms of contempt, has been so prolific of colleges, that it is now become a kind of Salamanca for the country at large; a place of resort for students from all parts.—It is well probably for Canada that Gourlay's scheme of draughting a batch of young students periodically to the old country, was not acted on. Canada would thereby possibly, on the one hand, have lost the services of some of the cleverest of her sons, who, on obtaining academic distinction would have preferred to remain n the mother country, entering on one or other of the public careers to which academic distinction there opens the ready path; and, on the other hand, she should, in many an instance, it is to be feared, have received back her sons, just unfitted in temper and habit, for life, under matter-of-fact, colonial conditions.

As a closing remark, we will observe that in the original planting of the Avenue, up whose fine vista we have been gazing, the mistake was committed of imitating nature too closely. A multitude of trees and shrubs of different kinds and habits were densely mingled together as they are usually to be seen in a wild primitive wood; and thus the growth and fair development of all were hindered. The horse-chestnuts alone should have been relied on to give character to the avenue; and of these there should have been on each side a double row, with a promenade for pedestrians underneath, after the manner of the great walks in the public parks of the old towns of Europe.

XXXVIII.—QUEEN STREET—FROM THE COLLEGE AVENUE TO JOHN STREET.

Pursuing our way now westward from the Avenue leading to the University, we pass the Powell park-lot, on which was, up to recent times, the family vault of the Powells, descendants of the Chief Justice. The whole property was named by the fancy of the first possessor, Caer-Hoel, Castle-Hoel, in allusion to the mythic Hoel, from whom all ap-Hoels boast to be sprung. Dummer Street, which opens northward a little further on, retains, as we have said, the second baptismal name of Chief Justice Powell.

Beverley-house and its surroundings, on the side opposite the Caer-Hoel estate, recall one whose name and memory must repeatedly recur in every narrative of our later Canadian history, Sir John Robinson.

The Park-lot which follows that occupied by Chief Justice Powell was selected by Solicitor General Gray, of whom fully already. It afterwards became the property of Mr. D'Arcy Boulton, eldost son of Mr. Justice Boulton, and was known as the Grange estate. The house which bears the name of the "Grange," was built at the beginning of the brick-era of York, and is a favorable specimen of the edifices of that period. The Grange-gate, now thrust far back by the progress of improvement, was long a familiar land-mark on the line of Lot Street. It was just within this gate that the fight already recorded took place between Mr. Justice Boulton's horses, *Bonaparte* and *Jefferson*, and the bears. A memorandum of Mr. G. S. Jarvis of Cornwall, in our possession, affirms that Mr. Justice Boulton drove a phaeton of some pretensions, and that his horses, *Bonaparte* and *Jefferson*, were the crack pair of the day at York. As to some other equipages he says: "The Lieut. Governor's carriage was considered a splendid affair, but some of the Toronto cabs would now throw it into the shade. The carriage of Chief Justice Powell, he adds, was a rough sort of omnibus, and would compare with the Gaol van used now." We remember the late Bishop's account of a carriage sent up for his own use from Albany or New York: it was constructed on the model of the ordinary oval stage coach, with a kind of hemispherical top. To our former notes of Mr. Justice Boulton, we add, that he was the author of a work in quarto published in London in 1806, entitled a "A Sketch of the Province of Upper Canada."

John Street, passing south just here, is, as was noted previously, a memorial, so far as its name is concerned, of the first Lieutenant Governor of Upper Canada. On the plan of the "new town," as the first expansion westward, of York, was termed,—while this street is marked "John,"—the next parallel thoroughfare eastward is named "Graves," and the open square included between the two, southward on Front Street, is "Simcoe-place." The three names of the founder of York were thus commemorated. The expression "Simcoe-place" has fallen into disuse. It indicated, of course, the site of the present Parliament Buildings of the Province of Ontario. Graves Street has become Simcoe Street, a name, as we have seen, recently extended to the thoroughfare northward, with which it is nearly in a right line, viz., William Street, which previously recorded, as we have said, the first Christian name of Chief Justice Powell. The name "John Street" has escaped change. The name sounds trivial enough; but it has an interest.

In the minds of the present generation, with John Street will be specially associated the memorable landing of the Prince of Wales at Toronto in 1860. At the foot of John Street, for that occasion, there was built, as will be remembered, a vast semi-colosseum of wood, opening out upon the waters of the Bay; a pile whose capacious concavity was densely filled again and again, during the Prince's visit, with the inhabitants of the town and the population of the surrounding country. And on the brow of the bank, immediately above the so-called amphitheatre, and exactly in the line of John Street was erected a finely designed triumphal arch, recalling those of Septimius Severus and Titus. This architectural object, while it stood, gave a peculiarly fine finish to the vista, looking southward along John Street. The usually monotonous water-view presented by the bay and lake, and even the common-place straight line of the Island, seen through the frame-work of three lofty vaulted passages, acquired for the moment a genuine picturesqueness. An ephemeral monument it was indeed; but as long as it stood its effect was delightfully classic and beautiful. The whole group—the arch and the huge amphitheatre below, furnished around its upper rim at equal intervals with tall masts, each bearing a graceful gonfalon, and each helping to sustain on high a luxuriant festoon of evergreen which

alternately drooped and rose again round the whole structure and along the two sides of the grand roadway up to the arch—all seen under a sky of pure azure, and bathed in cheery sunlight, surrounded too and thronged with a pleased multitude—constituted a spectacle not likely to be forgotten.

Turning down John Street a few chains, the curious observer may see on his left a particle of the old area of York retaining several of its original natural features. In the portion of the Macdonell-block not yet divided into building-slips we have a fragment of one of the many shallow ravines which meandered capriciously, every here and there, across the broad site of the intended town. To the passer-by it now presents a refreshing bit of bowery meadow, out of which towers up one of the grand elm-trees of the country, with stem of great height and girth, and head of very graceful form, whose healthy and undecayed limbs and long-trailing branchlets, clearly shew that the human regard which has led to the preservation hitherto of this solitary survivor of the forest, has not been thrown away. This elm and the surrounding grove are still favorite stations or resting-places for our migratory birds. Here, for one place, in the spring, are sure to be heard the first notes of the robin.

At the south-east angle of the Macdonell block still stands in a good state of preservation the mansion put up by the Hon. Alexander Macdonell. We have from time to time spoken of the brick era of York. Mr. Macdonell's imposing old homestead may be described as belonging to an immediately preceding era—the age of framed timber and weather-board, which followed the primitive or hewn-log period. It is a building of two full storeys, each of considerable elevation. A central portico with columns of the whole height of the house, gives it an air of dignity.

Mr. Macdonell was one more in that large group of military men who served in the American Revolutionary war, under Col. Simcoe, and who were attracted to Upper Canada by the prospects held out by that officer when appointed Governor of the new colony. Mr. Macdonell was the first Sheriff of the Home District. He represented in successive parliaments the Highland constituency of Glengary, and was chosen Speaker of the House. He was afterwards summoned to the Upper House. He was a friend and correspondent of the Earl of Selkirk, and was desired by that zealous emigrational theorist to undertake the superintendence of the settlement at Kildonan on the Red River. Though he declined this task, he undertook the management of one of the other Highland settlements included in the Earl of Selkirk's scheme, namely, that of Baldoon, on Lake St. Clair; Mr. Douglas undertaking the care of that established at Moulton, at the mouth of the Grand River. Mr. Macdonell, in person rather tall and thin, of thoughtful aspect, and in manner quiet and reserved, is one of the company of our early worthies whom we personally well remember. An interesting portrait of him exists in the possession of his descendants: it presents him with his hair in powder, and otherwise in the costume of "sixty years since." He died in 1842, "amid," a contemporary obituary speaks, "the regrets of a community who loved him for the mild excellence of his domestic and private charactar, no less than they esteemed him as a public man." Mr. Miles Macdonell, the first Governor of Assiniboia, under the auspices of the Hudson's Bay Company, and Alexander Macdonell, the chief representative in 1816 of the rival and even hostile Company of the North West Traders of Montreal, were both near relations of Mr. Macdonell of York, as also was the barrister lost in the *Speedy*, and the well-known R. C. Bishop Macdonell, of Kingston. Col. Macdonell, slain at Queenston, with General Brock, and whose remains are deposited beneath the column there, was his brother. His son, Mr. Allan Macdonell, has on several occasions stood forward as the friend and spirited advocate of the Indian Tribes, especially of the Lake Superior region, on occasions when their interests, as native lords of the soil, seemed in danger of being overlooked by the Government of the day.

On Richmond Street a little to the west of the Macdonell block, was the town residence of Col. Smith, some time President of the Province of Upper Canada. He was also allied to the family of Mr. Macdonell. Col. Smith's original homestead was on the Lake Shore to the west, in the neighbourhood of the river Etobicoke. Gourlay in his "Statistical Account of Upper Canada," has chanced to speak of it. "I shall describe the residence and neighbourhood of the President of Upper Canada from remembrance," he says, "journeying past it on my way to York from the westward, by what is called the Lake Road through Etobicoke. For many miles," he says, "not a house had appeared when I came to that of Colonel Smith's, lonely and

desolate. It had once been genteel and comfortable; but was now going to decay. A vista had been opened through the woods towards Lake Ontario; but the riotous and dangling undergrowth seemed threatening to retake possession from the Colonel, of all that had once been cleared, which was of narrow compass. How could a solitary half-pay officer help himself," candidly asks Gourlay, "settled down upon a block of land, whose very extent barred out the assistance and convenience of neighbours? Not a living thing was to be seen around. How different might it be, thought I, were a hundred industrious families compactly settled here out of the redundant population of England! The road was miserable," he continues; "a little way beyond the President's house it was lost on a bank of loose gravel flung up between the contending waters of the lake and the Etobicoke stream." He here went astray. "It was my anxious wish," he says, "to get through the woods before dusk; but the light was nearly gone before the gravel bank was cleared. There seemed but one path, which took to the left. It led me astray: I was lost: and there was nothing for it but to let my little horse take his own way. Abundant time was afforded for reflection on the wretched state of property flung away on half-pay officers. Here was the head man of the Province, 'born to blush unseen,' without even a tolerable bridle-way between him and the capital city, after more than twenty years' possession of his domain. The very gravel-bed which caused me such turmoil might have made a turnpike, but what can be done by a single hand? The President could do little with the axe or wheelbarrow himself; and half-pay could employ but few labourers at 3s. 6d. per day with victuals and drink." He recovers the road at length and then concludes: "After many a weary twist and turn I found myself," he says, "on the banks of the Humber, where there was a house and a boat." In the *Gazette and Oracle* of Saturday, Oct. 26, 1779, published at York, we have the record of Col. Smith's marriage. We give it as another specimen of the quaint style occasionally adopted at the period in such announcements: "Married last Monday, by the Rev. Mr. Addison, Colonel Smith, of the Queen's Rangers, to the most agreeable and accomplished Miss Mary Clarke."—Col. Smith did something in his day, to improve the breed of horses in Upper Canada. He expended considerable sums of money in the importation of choice animals of that species from the United States.

The house which led us to this notice of President Smith is, as we have said, situated on Richmond Street. On Adelaide Street, immediately south of this house, and also a little west of the Macdonell block, was a residence of mark, erected at an early period by Mr. Hugh Heward, and memorable as having been the abode for a time of the Naval Commissioner or Commodore, Bouchette, who first took the soundings and constructed a map of the harbour of York. His portrait is to be seen prefixed to his well-known "British Dominions in North America." The same house was also once occupied by Dr. Stuart, afterwards Archdeacon of Kingston; and at a later period by Mrs. Caldwell, widow of Dr. Caldwell, connected with the Naval establishment at Penetanguishene. Her sons, John and Leslie, two tall sociable youths, now both deceased, were our classmates at school. We observe in the *Oracle* of Saturday, May 28, 1803, a notice of Mr. Hugh Heward's death in the following terms: "Died lately at Niagara, on his way to Detroit, after a lingering illness, Mr. Hugh Heward, formerly clerk in the Lieut. Governor's office, and a respectable inhabitant of this town (York)." Just beyond was the abode of Lieut. Col. Foster, long Adjutant General of Militia; an officer of the antique Wellington school, of a fine type, portly in figure, authoritative in air and voice; in spirit and heart warm and frank. His son Colley, also we here name, as a congenial and attached schoolboy friend, likewise now deceased, after a brief but not undistinguished career at the Bar.

A few yards further on was the home of Mr. John Ross, whose almost prescriptive right it gradually became, whenever a death occurred in one of the old families, to undertake the funeral obsequies. Few were there of the ancient inhabitants who had not found themselves, at one time or another, wending their way, on a sad errand, to Mr. Ross's doorstep. On his sombre and very unpretending premises were put together the perishable shells in which the mortal remains of a large proportion of the primitive householders of York and their families are now reverting to their original dust. Almost up to the moment of his own summons to depart hence, he continued to ply his customary business, being favoured with an old age unusually green and vigorous, like "the ferryman austere and stern," Charon; to whom also the "inculta canities" of a plentiful supply of hair and beard, along with a certain staidness, taciturnity and rural homeliness of manner and attire, further suggested a resemblance.

Many things thus combined to render Mr. John Ross not the least notable of our local dramat personæ. He was led, as we have understood, to the particular business, which was his usual avocation, by the accident of having been desired, whilst out on active service as a militiaman in 1812, to take charge of the body of Gen. Brock, when that officer was killed on Queenston Heights.

While in this quarter we should pause too for a moment before the former abode of Mr. Robert Stanton, sometime King's Printer for Upper Canada, as noted already, and afterwards editor of the *Loyalist*; and subsequently Collector of Customs at York:—a structure of the secondary brick period, and situated on Peter Street, but commanding the view eastward along the whole length of Richmond Street. Mr. Stanton's father was an officer in the Navy, who between the year 1771 and 1786 saw much active service in the East and West Indies, in the Mediterranean, at the seige of Gibraltar under General Elliott, and on the American coast during the Revolutionary war. From 1786 to 1828 he was in the public service in several military and civil capacities in Lower and Upper Canada. In 1806 he was, for one thing, we find, issuer of Marriage Licenses at York. From memoranda of his while acting in this capacity we make a few extracts. The unceremoniousness of the record in the majority of cases, is refreshing. The names are all familiar ones in this neighbourhood. The parties set down as about to pledge their troth, either to other, have not, in every instance, even yet (1871), passed off the scene.

1806, Nov. 26, Stephen Heward to Mary Robinson. Same date, Ely Playter to Sophia Beman. Dec. 11, same year, Geo. T. Denison to C. B. Lippincott. 1807, Feb. 3, Jordan Post to M. Woodruffe. July 13, Hiram Kendrick to Hester Vanderburgh. Dec. 28, Jarvis Ashley to Dorothy McDougal. 1808, Jan. 13, D'Arcy Boulton, Jun., to Sally Ann Robinson. March 17, James Finch to M. Reynolds. April 9, David Wilson to Susannah Stone. May 2, John Langstaff to Lucy Miles. May 30, John Murchison to Frances Hunt. Aug. 8, John Powell, Esq., to Miss Isabella Shaw. Sep. 12, Hugh Heward to Eliza Mnir. 1809, April 14, Nicholas Hagarman to Polly Fletcher. May 18, William Cornwall to Rhoda Terry. June 19, John Ashbridge to Sarah Mercer. June 21, Jonathan Ashbridge to Hannah Barton. July 15, Orrin Hale to Hannah Barrett. Aug. 5, Henry Drean to Jane Brooke. Dec. 14, John Thompson to Ann Smith. 1810, March 8, Andrew Thomson to Sarah Smith. March 30, Isaac Pilkington to Sarah McBride. June 2, Thomas Bright to Jane Hunter. July 3, John Scarlett to Mary Thomson. Sept. 10, William Smith to Eleaaor Thompson. June 22, William B. Sheldon to Jane Johnson. July 30, Robert Hamilton, gent., to Miss Maria Lavinia Jarvis. 1811, Sept. 20, George Duggan to Mary Jackson.

The family of Mr. Stanton, senior, was large. It was augmented by twins on five several occasions. Not far from Mr. Stanton's house, a lesser edifice of brick of comparatively late date on the north side of Richmond Street, immediately opposite the premises associated just now with the memory of President Smith, may be noted as having been built and occupied by the distinguished Admiral Vansittart, and the first example in this region, of a cottage furnished with light, tasteful verandahs in the modern style.

XXXIX.—QUEEN STREET—FROM JOHN STREET TO BROCK STREET AND SPADINA AVENUE.

We now return from our digression, and again proceed on our way westward. The grantee of the park-lot which followed Solicitor-General Gray's, was the famous Hon. Peter Russell, of whom we have had occasion again and again to speak. A portion of the property was brought under cultivation at an early period, and a substantial farm-house put up thereon—a building which in 1871 is still in existence. The name attached to this house and clearing was Peterfield. Human depredators prowled about a solitary place like this. At their hands in 1803, Mr. Russell suffered a serious loss, as we learn from an advertisement which about midsummer in that year appeared in several successive numbers of the *Oracle*. It ran as follows: "Five Guineas Reward. Stolen on the 12th or 13th instant from Mr. Russell's farm, near this town, a Turkey Hen, with her brood of six half-grown young ones. Whoever will give such information and evidence as may lead to the discovery of the Thieves shall receive from the subscriber the above reward upon conviction of any of the delinquents. Peter Russell, York, Aug. 15th, 1803." Another advertisement has been mentioned to us, issuing from the same

sufferer, announcing the theft of a Plough from the same farm. We observe that Mr. Justice Allcock, in May, 1802, lost in a similar way the iron teeth out of his harrow. In the *Oracle* of the date named we read:—"Twenty Dollars Reward will be paid by the subscriber to any person who will discover the man who is so depraved and lost to every sense of social duty, as to cut with an axe or knife, the withes which bound some of the fence round the late Chief Justice's Farm on Yonge Street, and to throw down the said Fence. Independent of the above inducement, it is the duty of every good member of society to endeavour to find out who the character is that can be guilty of such an infamous act, in order that he may be brought to justice. Robert J. D. Gray, York, June 28th, 1803."

Occasionally notices of the reverse order appear, indicative of honesty in finders. A homely article picked up on the Common was judged to be of sufficient importance to its owner to induce the finder to advertise as follows in the *Oracle* of Saturday, Aug. 14th, 1802:—"Found lately near the Garrison, a Cow-bell. Whoever has lost the same, may have it again by applying to the Printer hereof, on paying the expense of this advertisement, and proving property. York, Aug. 7, 1802." Again, in the *Oracle* of Feb. 25, 1804: "Found on Saturday last, the 11th instant, a Bar of Iron. The owner may have it again, by applying to the Printer hereof. York, Feb. 8th." And again: "Found on Friday, the 5th instant, two silk handkerchiefs. The owner can have them again by applying to the Printer, and paying the expense of this advertisement, York, Oct. 12th, 1804." In October, 1806, an Iron Pot was picked up: "Found, on Sunday last, the 12th instant, on the beach opposite Messrs. Ashbridge's; an Iron Pot capable of containing about two pails full. Whoever may own the above mentioned Pot, may have it again by proving property, and paying charges, on application to Samuel Lewis or to the Printer hereof. York, Oct. 16th, 1806." A barrel of flour was found on the beach near the Garrison in 1802, and was thus advertised: "The Public are hereby informed that there has been a barrel of flour left on the beach near the Garrison by persons unknown. Whoever will produce a just claim to the same may have it, by applying to the Garrison Sergeant-Major, and paying the expense of the present advertisement. J. Petto, G. S. Major, York, March 22, 1802."

Peter Russell's name has become locally a household word for a kind of *helluo agrorum*, an inordinate self-appropriator of broad acres; and not without some show of reason, as the following list to be seen in successive numbers of the *Oracle* of 1803 would seem to indicate. Of the lands enumerated he styles himself, at the close of the advertisement, the proprietor. We have no desire, however, to perpetuate the popular impression, which was that all the said properties had been patented by himself to himself. This, of course, was an impossibility. He simply chose, as he was at liberty to do, after acquiring what he and his family were entitled to legally, in the shape of grants, to invest his means in lands, which in every direction were to be had for a mere song.—The document spoken of reads thus: "To be Sold.—The Front Town Lot, with an excellent dwelling-house and a kitchen recently built thereon, in which Mr. John Denison now lives, in the town of York, with a very commodious water-lot adjoining, and possession given to the purchaser immediately. The Lots Nos. 5, 6, and 7 in the 2nd, and lots Nos. 6 and 7 in the 3rd concession of West Flamboro' township, containing 1,000 acres, on which there are some very good mill seats; the lots No. 4 and 5, in the 1st concession of East Flamboro' with their broken fronts, containing, according to the Patent, 600 acres more or less; the lots Nos. 1, 3 and 4 in the 2nd, and lots No. 2 and 3 in the 3rd concession of Beverley, containing 1,000 acres; the lots Nos. 16 in the 2nd and 3rd concession of the township of York containing 400 acres; the lots 32 and 33 with their broken fronts, in the 1st, and lots No. 31 and 32 in the 2nd concession of Whitby, containing 800 acres; the lots 22 and 24 in the 11th, lot 23 in the 12th, and No. 24 in the 13th and 14th concessions of Townsend, containing 1,000 acres; the lots No. 12, 13 and 14 in the 1st and 2nd concessions of Charlotteville, immediately behind the Town plot, containing 1,200 acres; the lots Nos. 16 and 17 in the 1st concession of Delaware township, on the river Thames (La Trench [*sic*]) containing 800 acres; the lots Nos. 1, 3, 4, 5, and 7 in the 10th; No. 1, 2, 4, 6, and 7 in the 11th, and Nos. 3, 4, 5, and 7 in the 12th concession of Dereham, containing 3,000 acres, with mill-seats thereon; and also the lots Nos. 22, 24, 25, 26, and 28 in the 1st, Nos. 22, 23, 25, 27 and 28 in the 3rd, Nos. 22, 24, 25, 26 and 28 in the 11th, and Nos. 22, 24, 25, 26 and 28 in the 12th concession of Norwich, containing 600 acres, with mill-seats thereon. The terms are either cash, or good bills of exchange on London, Montreal and Quebec, for the whole of such purchase, in which case a proportionably less price

will be expected, or the same for one moiety of each purchase, and bonds properly secured for principal and interest, until paid, for the other. The prices may be known by application to the proprietor at York. PETER RUSSELL."

An idea of the prospective value of property in Canada had clearly dawned upon the mind of Mr. Russell in the year 1803; and he aimed to create for himself speedily a handsome fortune. His plans, however, in the long run, came to little, as in another connexion, we have heard already. Survivors of the early period of Upper Canada have been heard sometimes to express, like Lord Clive, after his dealings with the rajahs, their surprise that they did not provide for themselves more largely than they did, when the broad acres of their adopted country were to be had to any extent, almost for the asking. But this reflection should console them; in few instances are the descendants of the early very large land holders much better off at the present hour than probably they would have been, had their fathers continued landless.

Mr. Russell's estate passed at his decease, as we have elsewhere stated, to his sister, Miss Elizabeth Russell; and from her at her decease, to Dr. W. W. Baldwin.

At the beginning of Peter Russell's advertisement of properties, it will have been observed that he offered for sale "an excellent dwelling-house in the town of York," described as being in the occupation of Mr. John Denison. The building referred to, situate, as it is further mentioned, on a "front town lot, with a very convenient water-lot adjoining," was the "ornamental cottage" noted in our journey along Front Street, as having been once inhabited by Major Hillier of the 74th. On its site was afterwards built Dr. Baldwin's town residence, which subsequently became first a Military Hospital and then the head office of the Toronto and Nipissing Railroad. But Peterfield was also associated with the history of Mr. Denison, who was the progenitor of the now numerous Canadian family of that name. Through an intimacy with Mr. Russell, springing out of several years' campaigning together in the American Revolutionary war, Mr. Denison was induced by that gentlemen, when about to leave England in an official capacity in company with General Simcoe, to emigrate with his family to Upper Canada in 1792. He first settled at Kingston, but, in 1796, removed to York, where, by the authority of Mr. Russell, he temporarily occupied Castle Frank on the Don. He then, as we have seen, occupied "the excellent dwelling-house" put up "on a front lot" in the town of York by Mr. Russell himself; and afterwards, he was again accommodated with quarters by his friend in the newly-erected homestead of Peterfield.

We have evidence that in 1805 a portion of Peterfield was under cultivation, and that under Mr. Denison's care it produced fine crops of a valuable vegetable. Under date of York, 20th December, 1805, in a contemporary *Oracle*, we have the following advertisement: "POTATOES: To be sold at Mr. Russell's Farm at Peterfield, by Mr. John Denison, in any quantities, not less than ten bushels, at Four Shillings York Currency the bushel, if delivered at the purchasers. houses, or Three Shillings the bushel, if taken by them from the Farm."

Our own personal recollection of Mr. Denison is associated with Peterfield, the homely cosiness of whose interior, often seen during its occupancy by him, lighted up by a rousing hospitable fire of great logs, piled high in one of the usual capacious and lofty fire-places of the time, made an indelible impression on the boyish fancy. The venerable Mrs. Sophia Denison, too, Mr. Denison's better half, was in like manner associated in our memory with the cheery interior of the ancient Peterfield farm-house—a fine old English matron and mother, of the antique, strongly-marked, vigorous and sterling type. She was one of the Taylors, of Essex; among whom, at home and abroad, ability and talent, and traits of a higher and more sacred character, are curiously hereditary. We shall have occasion, further on, to speak of the immediate descendants of these early occupants of Peterfield.

On the south side of the expansion of Queen Street, in front of Peterfield, and a little beyond Peter Street (which as we have previously noticed had its name from Peter Russell) was the abode of Mr. Dunn, long Receiver-General of Upper Canada. It was (and is) a retired family house almost hidden from the general view by a grove of ornamental trees. A quiet-looking gate led into a straight drive up to the house, out of Queen Street. Of Mr. Dunn we have already discoursed, and of Mrs. Dunn, one of the graceful lady-chiefs in the high life of York in the olden time. In the house at which we now pause was born their famous son, Alexander Roberts Dunn, in 1833; who not only had the honour of sharing in the charge of the Light

Brigade at Balaclava in 1856, now so renowned in history and song, but who, of all the six hundred there, won the highest meed of glory. Six feet three inches in stature, a most powerful and most skilful swordsman, and a stranger to fear, Lieut. Dunn, instead of consulting his own safety in the midst of that frightful and untoward mêlé, deliberately interposed for the protection of his comrades in arms. Old troopers of the Eleventh Hussars long told with kindly eyes how the young lieutenant seeing Sergeant Bentley of his own regiment attacked from behind by two or three Russian lancers, rushed upon them single-handed, and cut them down; how he saved the life of Sergeant Bond; how Private Levett owed his safety to the same friendly arm, when assailed by a Russian Hussar. Kinglake, the historian of the Crimean war, records that the Victoria Cross placed at the disposal of the Eleventh Hussars was unanimously awarded by them to Lieut. Dunn; the only cavalry officer who obtained the distinction. To the enthusiasm inspired by his brilliant reputation was mainly due the speedy formation in Canada of the Hundredth Regiment, the Prince of Wales' Royal Canadian Regiment, in 1857. Of this regiment, chiefly raised through his instrumentality, Mr. Dunn was gazetted the first major; and on the retirement of the Baron de Rottenburg from its command, he succeeded as its Lieutenant Colonel. In 1864 he was gazetted full Colonel: at the time he had barely completed his twenty-seventh year. Impatient of inactivity, he caused himself to be transferred to a command in India, where he speedily attracted the notice of General Napier, afterwards Lord Napier of Magdala; and he accompanied that officer in the expedition against King Theodore of Abyssinia. While halting at Senafè in that country, he was accidently killed by the sudden explosion of his rifle while out shooting deer. The sequel can best be given, as well as an impression of the feelings of his immediate associates on the deplorable occasion, by quoting the touching words of a letter addressed at the time to a near relative of Colonel Dunn, by a brother officer:

"In no regiment," says this friend, "was ever a commanding officer so missed as the one we have just so unhappily lost: such a courteous, thorough gentleman in word and deed, so thoughtful for others, so perfect a soldier, so confidence-inspiring a leader. Every soldier in the regiment misses Colonel Dunn; he was a friend, and felt to be such, to every one of them. The regiment will never have so universally esteemed a commander again. We all feel that. For myself I feel that I have lost a brother who can never be replaced. I can scarcely yet realize that the dear fellow is really dead, and as I pass his tent every morning I involuntarily turn my head, expecting to hear his usual kind salutation, and to see the dear, handsome face that has never looked at me but with kindness. I breakfasted with him on the morning of the 25th, and he looked so well as he started off with our surgeon for a day's shooting. Little did I think that I had looked on his dear old face for the last time in life. * * * I cannot describe to you what a shock the sad news was to every one, both in my regiment and indeed in every one in the camp. Our dear Colonel was so well known, and so universally liked and respected."

"Next day, Sunday, the 26th of January, he was buried about 4 o'clock P.M. I went to look at the dear old fellow, before his coffin was closed, and his poor face, though looking so cold, was yet so handsome, and the expression of it, so peaceful and happy. I cut off some of his hair, which lately he wore very short, a lock of which I now send you, keeping one for myself, as the most valuable souvenir I could have of one I loved very dearly. And I knelt down to give his cold forehead a long farewell kiss. He was buried in uniform, as he had often expressed a wish to me to that effect. Every officer in the camp attended his funeral, and, of course, the whole of his own regiment, in which there was not a single dry eye, as all stood round the grave of their lost commander. He has been buried in a piece of ground near where our camp now stands, at the foot of a small hill covered with shrubbery and many wild flowers. We have had railings put round the grave, and a stone is to be placed there with the inscription: In memory of A. R. Dunn, V.C., Col. 33rd Regiment, who died at Senafé on the 25th January, 1868, aged 34 years and 7 months."

Thus in remote Abyssinia rest the mortal remains of one who in the happy unconsciousness of childhood, sported here in the grounds and groves which we are now passing on Queen Street. In numerous other regions of the earth, once seemingly as unlikely to be their respective final resting-places, repose the remains of Canadian youth, who have died in the public service of England. We are sharing in the fortune and history of the mother country,

and like her, or rather like the ubiquitous Roman citizen of old, we may even already ask "*Quæ caret ora cruore nostro?*"—sadly as individuals perhaps, but proudly as a people.

The occupant of Mr. Dunn's house at a later period was Chief Justice McLean, who died here in 1865. He was born at St. Andrews, near Cornwall, in 1791. At the battle of Queenston, he served as Lieutenant in Capt. Cameron's No. 1 Flank Company of York Militia, and received a severe wound in the early part of the engagement. He was afterwards for some time Speaker of the House. An admirable full-length painting of Chief Justice McLean exists at Osgoode Hall.

XL.—QUEEN STREET, FROM BROCK STREET AND SPADINA AVENUE TO BATHURST STREET.

Immediately after the grounds and property of Mr. Dunn, on the same side, and across the very broad Brock Street, which is an opening of modern date, was to be seen, until recently, a modest dwelling-place of wood, somewhat peculiar in expression, square, and rather tall for its depth and width, of dingy hue; its roof four-sided; below, a number of lean-to's and irregular extensions clustering round; in front, low shrubbery, a circular drive, and a wide, open-barred gate. This was the home of one who has acquired a distinguished place in our local annals, military and civil—Colonel James Fitzgibbon. A memorable exploit of his, in the war with the United States in 1813, was the capture of a force of 450 infantry, 50 cavalry and two guns, when in command himself, at the moment, of only forty-eight men. He had been put in charge of a depôt of stores, at the Beaver Dams, between Queenston and Thorold. Colonel Boerstler, of the invading army, was despatched from Fort George, at Niagara, with orders to take this depôt. Fitzgibbon was apprized of his approach. Reconnoitring, and discovering that Boerstler had been somewhat disconcerted, on his march, by a straggling fire from the woods, kept up by a few militiamen and about thirty Indians under Captain Kerr, he conceived the bold idea of dashing out and demanding a surrender of the enemy! Accordingly, spreading his little force judiciously, he suddenly presented himself, waving a white pocket-handkerchief. He was an officer, he hurriedly announced, in command of a detachment: his superior officer, with a large force, was in the rear; and the Indians were unmanageable. (Some extemporized war-whoops were to be heard at the moment in the distance.) The suggestion of a capitulation was listened to by Colonel Boerstler as a dictate of humanity. The truth was, Major DeHaren, of the Canadian force, to whom, in the neighbourhood of what is now St. Catharines, a message had been sent, was momentarily expected, with 200 men. To gain time, Fitzgibbon made it a matter of importance that the terms of the surrender should be reduced to writing. Scarcely was the document completed when DeHaren arrived. Had there been the least further delay on his part, how to dispose of the prisoners would have presented considerable difficulty.

Lieutenant Fitzgibbon was now soon Captain Fitzgibbon. He had previously been a private in the 19th and 61st Regiments, having enlisted in Ireland at the age of seventeen. On the day of his enrolment, he was promoted to the rank of sergeant; and a very few years later he was a sergeant-major. He saw active service in Holland and Denmark. His title of Colonel was derived from his rank in our Canadian Militia.

His tall, muscular figure, ever in buoyant motion; his gray, good-humoured, vivacious eye, beaming out from underneath a bushy, light-coloured eyebrow; the cheery ring of his voice, and its animated utterances, were familiar to everyone. In the midst of a gathering of the young, whether in the school-room or on the play-ground, his presence was always warmly hailed. They at once recognized in him a genuine sympathizer with themselves in their ways and wants; and he had ever ready for them words of hope and encouragement.

Our own last personal recollection of Colonel Fitzgibbon is connected with a visit which we chanced to pay him at his quarters in Windsor Castle, where, in his old age, through the interest of Lord Seaton, he had been appointed one of the Military Knights. Though most romantically ensconced and very comfortably lodged, within the walls of the noblest of all the royal residences of Europe, his heart, we found, was far away, ever recurring to the scenes of old activities. Where the light streamed in through what seemed properly a loophole for cannon, pierced through a wall several yards in thickness, we saw a pile of Canadian newspapers. To

pore over these was his favourite occupation. After chatting with him in his room, we attended Divine Service with him in the magnificent Chapel of St. George, close by. We then strolled together round the ramparts of the Castle, enjoying the incomparable views. Since the time of William IV. the habit of the Military Knights is that of an officer of high rank in full dress, cocked hat and feather included. As our venerable friend passed the several sentries placed at intervals about the Castle, arms were duly presented; an attention which each time elicited from the Colonel the words, rapidly interposed in the midst of a stream of earnest talk, and accompanied by deprecatory gestures of the hand, "Never mind *me*, boy! never mind *me*!"

Colonel Fitzgibbon took the fancy of Mrs. Jameson when in Canada. She devotes several pages of her "Winter Studies" to the story of his life. She gives some account of his marriage. The moment he received his captaincy, she tells us, "he surprised General Sheaffe, his commanding officer, by asking for a leave of absence, although the war was still at its height. In explanation, he said he wished to have his nuptials celebrated, so that if a fatal disaster happened to himself, his bride might enjoy the pension of a captain's widow. The desired leave was granted, and after riding some 150 miles and accomplishing his purpose, he was back in an incredibly short space of time at head-quarters again. No fatal disaster occurred, and he lived," Mrs. Jameson adds, "to be the father of four brave sons and one gentle daughter." The name of Colonel Fitzgibbon recalls the recollection of his sister, Mrs. Washburn, remarkable of old, in York, for dash and spirit on horseback, spite of extra *en bon point;* for a distinguished dignity of bearing, combined with a marked Hibernian heartiness and gaiety of manner. As to the "four brave sons and one gentle daughter," all have now passed away: one of the former met with a painful death from the giving way of a crowded gallery at a political meeting in the Market Square, as previously narrated. All four lads were favourites with their associates, and partook of their father's temperament.

Of Spadina Avenue, which we crossed in our approach to Col. Fitzgibbon's old home, and of Spadina house, visible in the far distance at the head of the Avenue, we have already treated in our collections and recollections, connected with Front Street.

In passing we make an addition to what was then said. The career of Dr. Baldwin, the projector of the Avenue, and the builder of Spadina, is now a part of Upper Canadian history. It presents a curious instance of that versatility which we have had occasion to notice in so many of the men who have been eminent in this country. A medical graduate of Edinburgh, and in that capacity, commencing life in Ireland—on settling in Canada, he began the study of Law and became a leading member of the Bar. On his arrival at York, from the first Canadian home of his father on Baldwin's Creek in the township of Clarke, his purpose was to turn to account for a time his own educational acquirements, by undertaking the office of a teacher of youth. In several successive numbers of the *Oracle* of 1802–3 we read the following advertisement: "Dr. Baldwin, understanding that some of the gentlemen of this Town have expressed some anxiety for the establishment of a Classical School, begs leave to inform them and the public that he intends on Monday the first day of January next, to open a School in which he will instruct Twelve Boys in Writing, Reading, the Classics and Arithmetic. The terms are, for each boy, eight guineas per annum, to be paid quarterly or half-yearly; one guinea entrance and one cord of wood to be supplied by each of the boys on opening the School. *N.B.*—Mr. Baldwin will meet his pupils at Mr. Willcocks' house on Duke Street. York, December, 18th, 1802." We have not at hand any record of the results of this enterprise.

The Russell bequest augmented in no slight degree the previous possessions of Dr. Baldwin. We have probably in the magnificent dimensions assigned to the thoroughfare opened up by him in the neighbourhood of Peterfield, a visible expression of the large-handed generosity which a pleasant windfall is apt to inspire. Spadina Avenue is 160 feet wide throughout its mile-and-a-half length; and the part of Queen Street which bounds the front of the Peterfield park lot, is made suddenly to expand to the width of 90 feet. Maria Street also, a short street here, is of extra width. The portion of York, now Toronto, laid out by Dr. Baldwin on a fraction of the land opportunely inherited, will, when solidly built over, rival Washington or St. Petersburg in grandeur of ground-plan and design.

The career of Dr. Rolph, another of our early Upper Canadian notabilities, resembles in some respects, that of Dr. Baldwin. Before emigrating from Gloucestershire, he began life as a medical man. On arriving in Canada he transferred himself to the Bar. In this case however,

after the attainment of eminence in the newly adopted profession, there was a return to the original pursuit, with the acquisition in that also, of a splendid reputation. Both acquired the local style of Honourable: Dr. Rolph by having been a member of the Hincks-ministry from 1851 to 1854; Dr. Baldwin by being summoned, six months before his decease, to the Legislative Council of United Canada, while his son was Attorney-General.

Mr. William Willcocks, allied by marriage to Dr. Baldwin's family, selected the park-lot at which we arrive after crossing Spadina Avenue. A lake in the Oak Ridges (Lake Willcocks) has its name from the same early inhabitant. In 1802 he was Judge of the Home District Court. He is to be distinguished from the ultra-Reformer, Sheriff Willcocks, of Judge Thorpe's day, whose name was Joseph; and from Charles Willcocks, who in 1818 was proposing, through the columns of the *Upper Canada Gazette*, to publish, by subscription, a history of his own life. The advertisement was as follows (what finally came of it, we are not able to state):—"The subscriber proposes to publish, by subscription, a History of his Life. The subscription to be One Dollar, to be paid by each subscriber; one half in advance; the other half on the delivery of the Book. The money to be paid to his agent, Mr. Thomas Deary, who will give receipts and deliver the Books. Charles Willcocks, late Lieutenant, City of Cork Militia. York, March 17, 1818."—This Mr. Charles Willcocks once fancied he had grounds for challenging his namesake, Joseph, to mortal combat, according to the barbaric notions of the time. But at the hour named for the meeting, Joseph did not appear on the ground. Charles waited a reasonable time. He then chipped off a square inch or two of the bark of a neighbouring tree, and, stationing himself at duelling distance, discharged his pistol at the mark which he had made. As the ball buried itself in the spot at which aim had been taken, he loudly bewailed his old friend's reluctance to face him. "Oh, Joe, Joe!" he passionately cried, "if you had only been here!" Although Joseph escaped this time, he was not so fortunate afterwards. He fell, as we have already noted in connexion with the Early Press, "foremost fighting" in the ranks of the invaders of Upper Canada in 1814. The incident is briefly mentioned in the *Montreal Herald* of the 15th October in that year, in the following terms: "It is officially announced by General Ripley (on the American side, that is), that the traitor Willcocks was killed in the sortie from Fort Erie on the 4th ult., greatly lamented by his general and the army." Undertaking with impetuosity a crusade against the governmental ideas which were locally in the ascendant, and encountering the resistance customary in such cases, he cut the knot of his discontent by joining the Republican force when it made its appearance.

The Willcocks park-lot, or a portion of it, was afterwards possessed by Mr. Billings, a well-remembered Commissariat officer, long stationed at York. He built the house subsequently known as Englefield, which, later, was the home of Colonel Loring, who, at the time of the taking of York, in 1813, had his horse killed under him; and here he died. Mr. Billings and Colonel Loring both had sons, of whom we make brief mention as having been in the olden time among our own school-boy associates, but who now, like so many more personal contemporaries, already noted, are, after brief careers, deceased.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MAY, 1870.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Re-sult'.	M'N.		
1	—	29.768	—	—	° —	° 66.3	° —	° —	° —	—	.099	—	—	—	15	—	—	S W b W	N N W	Calm.	N 32 W	8.0	19.5	0.0	7.60	7.87	...	...
2	29.902	.829	29.705	29.8010	46.8	59.4	50.0	52.32	+ 5.13	.234	.211	.164	.202	74	41	46	52	N b E	E S E	Calm.	S 78 E	0.5	5.5	0.0	2.42	2.62	...	...
3	.639	.462	.340	.4712	42.1	61.6	60.9	55.72	+ 8.17	.204	.268	.368	.276	76	48	69	62	Calm.	S E b E	Calm.	N 46 W	0.0	3.4	0.0	1.03	3.48	...	...
4	.386	.379	.513	.4302	57.6	72.8	57.6	62.13	+14.23	.353	.321	.277	.298	74	40	58	54	N W	N W b N	E b N	N 3 W	7.0	12.8	6.2	7.73	10.17	...	...
5	.606	.599	.500	.5607	50.0	54.7	50.8	52.55	+ 4.28	.212	.213	.194	.208	59	48	50	52	E N E	E b S	Calm.	N 83 E	6.2	6.0	0.0	4.64	4.82	...	...
6	.403	.273	.161	.2560	52.2	55.5	47.1	51.83	+ 3.18	.145	.151	.291	.204	36	33	90	55	E N E	E b N	N E b E	N 74 E	6.4	15.0	1.2	8.08	8.48	.350	...
7	.116	.162	.237	.1760	46.1	49.7	45.4	47.40	— 1.58	.234	.227	.190	.211	75	63	62	64	N E b E	E b N	E b N	N 31 E	8.0	1.6	3.6	2.16	2.35	.500	...
8	—	.262	—	—	—	56.5	—	—	—	—	.292	—	—	—	63	—	—	N N E	S b E	N W b N	S 87 E	0.3	5.6	2.9	0.71	2.42	...	...
9	.363	.334	.362	.3540	47.5	64.8	50.8	55.08	+ 5.40	.283	.292	.262	.280	86	47	69	65	Calm.	S E b S	Calm.	N 56 E	0.0	5.8	0.0	0.63	2.41	.080	...
10	.391	.401	.475	.4238	46.4	53.6	42.8	47.08	— 2.97	.290	.340	.258	.292	92	82	94	90	Calm.	S E b E	E	S 84 E	0.0	2.8	0.5	1.31	1.92	.090	...
11	.483	.461	.505	.4855	42.8	55.8	47.2	48.83	— 1.57	.268	.291	.287	.282	98	65	88	83	Calm.	E S E	S W b S	S 58 E	0.0	10.0	2.2	3.19	4.52	...	...
12	.509	.507	.552	.5252	48.6	54.4	47.1	49.50	— 1.22	.292	.298	.260	.282	85	68	80	79	N W	S W b S	W b S	S 51 W	2.8	9.0	8.2	2.61	4.65	.130	...
13	.539	.537	.564	.5448	51.5	69.5	56.2	60.12	+ 9.02	.226	.143	.202	.199	58	19	44	40	N N W	N W b N	N W b N	N 29 W	11.2	18.0	11.5	12.70	12.89	...	...
14	.626	.572	.590	.5910	54.4	73.1	60.1	64.53	+13.10	.246	.367	.288	.292	57	44	54	49	N W	S S W	W b S	S 80 W	5.6	7.0	4.6	5.69	6.45	...	...
15	—	.564	—	—	—	77.1	—	—	—	—	.405	—	—	—	43	—	—	W b N	W b S	W S W	S 59 W	2.8	10.5	1.5	5.08	5.44	...	...
16	.521	.454	.575	.5190	57.3	70.2	54.4	61.53	+ 9.40	.368	.405	.362	.390	78	54	86	72	W S W	S b E	E S E	N 83 E	1.0	3.6	9.4	2.81	5.37	Inap.	...
17	.664	.707	.717	.6992	48.9	59.4	53.3	54.58	+ 2.10	.308	.318	.210	.272	88	63	51	64	Calm.	S b W	S E b E	S 45 E	0.0	4.4	3.4	2.89	3.24	...	...
18	.735	.713	.685	.7047	52.6	68.1	56.5	58.53	+ 5.72	.279	.458	.413	.379	71	67	90	77	E b S	S E	Calm.	S 76 E	2.0	3.2	0.0	4.22	4.38	...	...
19	.717	.679	.711	.7047	57.3	71.7	64.8	65.13	+11.97	.414	.372	.326	.379	88	48	53	63	E	S W b S	N b W	N 84 W	0.5	7.4	2.0	1.21	4.26	...	...
20	.793	.744	.749	.7625	59.1	73.5	58.7	64.00	+10.47	.322	.269	.272	.293	64	32	55	51	N b W	S	E S E	S 42 E	3.2	7.2	3.4	2.15	3.55	...	...
21	.715	.717	.744	.7257	58.0	52.9	50.0	54.42	+ 0.55	.260	.276	.283	.267	54	69	78	64	N E b E	E	E	N 84 E	7.2	2.5	0.8	2.94	3.04	.010	...
22	—	.879	—	—	—	51.1	—	—	—	—	.278	—	—	—	74	—	—	Calm.	E b S	E	S 73 E	0.0	8.4	3.6	3.77	4.67	.240	...
23	.647	.524	.396	.5105	46.8	54.7	50.4	49.68	— 4.87	.293	.325	.345	.311	91	76	94	87	N W	E b S	Calm.	N 86 E	4.0	10.6	0.0	3.92	4.46	.200	...
24	.338	.379	.453	.4003	52.6	63.4	56.5	58.53	+ 3.63	.386	.311	.356	.369	97	53	78	76	W b N	W	W b N	N 85 W	3.0	22.4	4.8	11.41	11.67	...	...
25	.494	.562	.657	.5780	52.6	56.9	48.2	52.15	— 3.08	.287	.296	.245	.267	73	64	72	68	W b N	W N W	N b W	N 46 W	13.6	11.8	5.6	8.31	10.10	...	...
26	.690	.679	.665	.6765	49.0	53.6	46.4	50.75	— 4.82	.205	.236	.230	.227	59	57	72	61	N E	S E	E S E	N 80 E	10.2	9.6	3.2	5.66	7.72	...	...
27	.689	.679	.640	.6667	55.8	61.6	55.4	57.55	+ 1.65	.247	.278	.274	.248	55	50	62	52	E N E	E b S	N E b E	N 70 E	11.0	9.0	5.8	7.15	8.80	...	...
28	.577	.548	.516	.5420	52.6	63.0	56.9	59.07	+ 2.85	.249	.305	.254	.259	62	53	54	51	N b E	S	S W b S	S 6 E	6.4	4.4	4.8	1.22	5.60	...	...
29	—	.606	—	—	—	71.3	—	—	—	—	.300	—	—	—	38	—	—	N W b N	S b W	N b W	N 21 W	4.1	6.5	8.1	2.13	5.96	...	...
30	.747	.754	.753	.7597	63.0	76.7	67.3	68.53	+11.67	.227	.318	.292	.291	39	34	43	40	N W b N	W b N	N W	N 67 W	5.2	4.9	10.8	2.02	3.83	Inap.	...
31	.782	.770	.745	.7628	59.8	67.4	59.4	62.32	+ 5.15	.312	.351	.434	.344	61	52	86	63	Calm.	E b S	Calm.	S 83 E	0.0	7.0	0.0	2.58	2.71	...	...
	29.5797	29.5548	29.5581	29.5627	51.98	62.23	53.62	56.30	+ 4.21	.275	.294	.282	.282	71	53	68	63	.....	.....	.....	.....	4.21	8.24	3.49	.....	5.48	1.150	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MAY, 1870.

NOTE—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....29.918 at 8 a.m. on 22nd } Monthly range=
Lowest Barometer .....29.116 at 6 a.m. on 7th } 0.802 inches.

Self-registering Ther.
- Maximum Temperature ..... 81°2 on 14th } Monthly range=
- Minimum Temperature..... 38°8 on 3rd } 42°4
- Mean Maximum Temperature .....66°48 } Mean daily range=
- Mean Minimum Temperature .....47°37 } 19°11
- Greatest daily range.....30°8 from a.m. to p.m. of 13th.
- Least daily range ..... 7°5 from a.m. to p.m. of 25th.

Warmest Day.....30th...Mean Temperature.....68°53 }
Coldest Day.....10th...Mean Temperature.....47°08 } Difference=21°45

Maximum Radiation. { Solar .....96°5 on 30th } Monthly range=
{ Terrestrial.....28°0 on 1st } 68°5

Aurora observed on 7 nights viz., 1st, 2nd, 17th, 19th, 20th 27th and 28th.

Possible to see Aurora on 19 nights; impossible on 12 nights.

Raining on 10 days; depth 1.150 inches; duration of fall 26.4 hours.

Mean of Cloudiness=0.61.

WIND.

Resultant Direction N. 23° E.; Resultant Velocity 1.09.

Mean Velocity 5.48 miles per hour.

Maximum Velocity 21.8 miles, from 2 to 3 p.m. of 24th.

Most Windy day 24th; Mean Velocity 11.67 miles per hour.

Least Windy day 10th; Mean Velocity 1.92 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 8.52 miles per hour.

Least Windy hour 7 p.m.; Mean Velocity 3.12 miles per hour.

Thunder on 11th and 30th.

Solar haloes on 16th, 26th and 27th. Lunar haloes on 7th, 8th and 9th.

The solar haloes on the 26th and 27th were very fine.

Last frost of season on 13th. Thin ice at 5 a.m. of same day.

COMPARATIVE TABLE FOR MAY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°					°		
1842	49.1	— 2.3	74.8	27.3	47.5	7	1.275	0	0.0	...	...	0.53 lbs
1843	49.1	— 2.3	79.8	29.2	50.6	5	1.570	0	0.0	...	...	0.52
1844	53.6	+ 2.2	78.4	28.7	49.7	14	5.670	0	0.0	...	...	0.30
1845	49.6	— 1.8	77.8	27.8	50.0	8	2.300	0	0.0	...	...	0.55
1846	55.5	+ 4.1	79.7	33.1	46.6	9	4.375	0	0.0	...	...	0.46
1847	54.4	+ 3.0	72.1	26.7	45.4	12	2.040	0	0.0	...	...	0.29
1848	54.1	+ 2.7	78.0	31.3	46.7	13	2.520	0	0.0	N 40 W	1.31	4.93mls
1849	48.0	— 3.4	72.2	27.9	44.3	16	5.115	0	0.0	N 51 E	1.97	5.33
1850	47.6	— 3.8	77.8	27.5	50.3	17	0.545	1	Inap.	N 64 W	2.05	6.32
1851	51.3	— 0.1	73.3	28.0	45.3	12	2.950	1	0.5	N 32 W	1.59	6.34
1852	51.4	0.0	73.3	32.0	41.3	7	1.125	1	Inap.	S 82 W	0.99	4.00
1853	50.9	— 0.5	78.4	32.2	46.2	17	4.420	1	Inap.	N 2 W	0.83	5.16
1854	52.2	+ 0.8	71.4	25.2	46.2	11	4.630	0	0.0	E	0.40	5.38
1855	53.1	+ 1.7	77.5	33.0	44.5	6	2.565	2	0.9	N 1 W	2.76	5.93
1856	50.5	— 0.9	82.2	31.2	51.0	14	4.580	1	Inap.	N 4 E	3.99	9.81
1857	48.9	— 2.5	74.8	26.0	48.8	15	4.145	1	Inap.	N 23 W	1.14	8.13
1858	48.9	— 2.5	69.8	31.0	38.8	17	6.367	0	0.0	N 42 E	3.33	9.30
1859	55.2	+ 3.8	79.6	39.5	40.1	11	3.410	0	0.0	N 72 E	1.59	5.70
1860	55.5	+ 4.1	74.5	32.5	42.0	16	1.815	0	0.0	N 26 E	2.66	7.17
1861	47.5	— 3.9	73.0	28.0	45.0	12	3.380	1	0.5	N 47 W	3.60	9.17
1862	52.2	+ 0.8	78.5	32.4	46.1	8	1.427	0	0.0	N 52 W	2.80	7.87
1863	54.3	+ 2.9	79.0	36.4	42.6	14	3.363	1	0.1	N 56 E	0.41	5.89
1864	54.8	+ 3.4	79.0	32.2	46.8	18	4.070	0	0.0	N 7 W	1.86	5.64
1865	52.3	+ 0.9	79.0	30.0	49.0	11	4.005	0	0.0	N 3 W	1.65	5.48
1866	48.3	— 3.1	73.4	33.4	40.0	13	2.820	0	0.0	N 46 W	4.49	9.26
1867	46.5	— 4.9	65.0	24.6	40.4	18	3.220	1	Inap.	N 51 W	3.55	8.40
1868	51.8	+ 0.4	73.0	33.2	39.8	16	7.670	0	0.0	N 38 E	3.16	6.87
1869	50.8	— 0.6	74.2	31.4	42.8	16	2.805	1	Inap.	N 20 W	2.38	6.55
1870	56.3	+ 4.9	81.2	38.8	42.4	10	1.150	0	0.0	N 23 E	1.09	5.48
Resu'ts to 1869.	51.39	...	75.70	30.42	45.28	12.10	3.356	0.4	0.07	N 12 W	1.70	6.76
Excess for '70	+ 4.91	...	+ 5.50	+ 8.38	— 2.88	— 2.1	— 2.206	— 0.4	— 0.07	...	...	— 1.28

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—JUNE, 1870.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°																		
1	29.735	29.667	29.616	29.6643	55.1	76.4	55.5	60.62	+ 3.12	.375	.441	.381	.405	86	64	86	77	Calm.	S E b E	Calm.	S 63 E	0.0	2.0	0.0	0.52	0.58	..	...
2	.613	.526	.528	.5497	59.8	28.0	60.5	65.37	+ 7.57	.392	.406	.395	.412	76	52	75	67	Calm.	Calm.	Calm.	Calm.	0.0	0.0	0.0	0.00	0.00	...	...
3	.562	.557	.557	.5582	62.7	71.3	61.2	65.50	+ 7.37	.466	.524	.488	.475	82	68	90	76	Calm.	E b N	N E b	N 82 E	0.0	11.0	2.6	4.56	4.80	...	...
4	.630	.596	.564	.5872	63.0	72.8	64.1	67.47	+ 9.00	.475	.574	.473	.522	82	71	78	77	N E b E	E S E	S b W	S 84 E	0.8	9.4	7.0	5.09	5.50	inap.	...
5	—	.448	—	—	—	63.0	—	—	—	—	.539	—	—	—	93	—	—	E N E	S E b E	S b E	S 69 E	5.2	3.6	1.3	2.28	3.41	.560	...
6	.502	.531	.553	.5358	61.6	72.8	62.7	65.68	+ 6.60	.507	.517	.441	.480	92	64	77	76	W S W	S b E	S W b S	S 13 E	1.6	7.5	1.0	3.27	4.96	...	...
7	.637	.617	.637	.6272	59.8	70.6	61.9	64.27	+ 4.87	.428	.437	.477	.464	83	58	86	77	N E	E S E	E N E	N 47 E	1.2	7.2	6.8	2.48	5.82	...	...
8	.647	.628	.538	.5938	61.6	72.4	66.6	66.68	+ 6.95	.381	.467	.415	.425	69	58	63	65	N W	S	S E	N 89 E	7.6	7.0	5.0	1.80	5.36	inap.	...
9	.463	.425	.406	.4280	60.9	67.0	60.1	62.90	+ 2.57	.441	.498	.501	.481	82	76	96	84	N E b E	E b S	S b E	N 56 E	4.8	5.0	2.2	2.16	6.28	.390	...
10	.388	.364	.442	.4012	56.2	59.4	56.5	57.43	— 2.93	.406	.410	.413	.413	90	81	91	87	N b E	N	N b W	N 11 W	9.5	9.8	5.0	7.35	7.56	.650	...
11	.479	.419	.378	.4245	56.2	61.0	55.8	58.17	— 2.53	.417	.481	.411	.440	93	87	93	91	N E b E	E N E	N E b E	N 59 E	2.2	8.8	2.8	3.31	3.65	2.360	...
12	—	.572	—	—	—	63.4	—	—	—	—	.431	—	—	—	74	—	—	E N E	E S E	N E b E	N 82 E	1.2	6.6	8.9	6.49	7.81	.350	...
13	.412	.484	.486	.4655	55.8	68.4	59.4	61.63	+ 0.36	.411	.456	.434	.438	93	65	86	81	E N E	S S W	Calm.	S 10 W	6.6	12.4	0.0	5.42	6.42	.060	...
14	.483	.426	.369	.4192	61.6	69.1	63.0	64.75	+ 3.08	.428	.457	.386	.430	78	64	67	70	S	S S W	S E b E	S 5 W	7.4	12.6	6.6	6.97	7.31	.200	...
15	.360	.438	.502	.4398	59.8	66.3	56.9	61.28	— 0.70	.480	.508	.351	.449	93	78	76	82	S W b S	S S E	Calm.	S 20 E	4.2	8.0	0.0	2.39	3.06	inap.	...
16	.575	.606	.613	.5998	56.9	71.7	63.7	65.23	+ 2.93	.396	.560	.465	.484	85	72	78	77	N E b E	S b W	N W	N 32 W	1.0	1.0	2.3	1.61	2.52	...	...
17	.657	.600	.653	.6398	61.9	84.7	74.2	74.93	+12.33	.425	.522	.456	.476	76	43	54	56	Calm.	N b W	N N W	N 19 W	0.0	9.6	10.0	5.37	5.98	...	...
18	.678	.661	.634	.6580	71.1	86.5	71.1	77.15	+14.23	.393	.464	.554	.505	51	36	73	55	N N W	N W b W	N W	N 36 W	7.4	9.0	6.0	4.72	5.42	...	...
19	—	.637	—	—	—	81.8	—	—	—	—	.637	—	—	—	58	—	—	N W b W	S b W	W b S	S 66 W	1.0	14.2	4.1	4.07	5.58	...	...
20	.499	.460	.573	.5167	68.8	78.2	60.5	69.22	+ 5.76	.515	.445	.303	.417	74	46	57	57	N W	N b W	N W b N	N 33 W	4.8	24.5	10.6	10.31	11.52	.010	...
21	.719	.762	.796	.7602	57.2	67.0	57.2	60.72	— 3.08	.293	.185	.229	.242	62	27	48	46	N N W	N N W	N	N 25 W	8.0	16.6	10.4	10.79	10.99	...	...
22	.877	.821	.779	.8217	60.1	72.8	59.8	64.95	+ 0.85	.243	.357	.428	.351	46	44	83	59	N N W	S W b S	S W	S 48 W	6.8	11.6	3.0	4.19	5.91	...	...
23	.837	.787	.747	.7913	59.0	80.7	71.0	70.23	+ 5.85	.439	.652	.570	.540	88	62	75	72	W	S	W b N	S 52 W	2.5	8.4	5.6	3.22	3.95	...	...
24	.797	.745	.729	.7498	68.4	84.7	70.2	75.47	+10.85	.533	.728	.565	.593	77	60	76	67	W b N	S b W	S	S 50 W	1.6	3.6	2.7	1.87	2.73	...	...
25	.721	.707	.697	.7063	69.9	73.1	70.6	72.10	+ 7.20	.584	.687	.690	.652	79	85	92	83	W b N	N E b E	W S W	S 52 W	1.0	7.7	1.0	1.61	3.24	.090	...
26	—	.726	—	—	—	81.1	—	—	—	—	.726	—	—	—	68	—	—	Calm.	S S E	Calm.	S 31 E	0.0	5.4	0.0	1.89	3.02	.750	...
27	.634	.600	.603	.5992	71.7	86.8	74.6	77.63	+12.25	.676	.840	.782	.746	88	66	91	80	S E b S	S b W	E b N	S 43 W	1.2	5.4	3.0	1.83	4.01	.670	...
28	.592	.536	.512	.5445	75.3	79.2	75.7	77.70	+12.05	.741	.705	.656	.711	84	70	74	75	W	S b W	N	N 12 E	2.2	3.5	9.2	0.78	5.12	inap.	...
29	.542	.520	.492	.5213	72.4	73.1	67.4	70.53	+ 4.67	.608	.367	.404	.458	76	44	59	61	E b N	E	Calm.	N 85 E	10.4	6.0	0.0	4.13	4.26	...	...
30	.385	.247	.291	.3065	69.2	83.9	61.2	71.85	+ 5.73	.537	.792	.512	.611	75	68	95	78	Calm.	S b W	N E b E	S 69 E	0.0	10.0	13.5	1.95	7.35	2.000	...
	29.5932	29.5665	29.5652	29.5734	62.92	73.63	63.90	67.29	+ 5.28	.461	.518	.468	.485	79	62	78	72	.....	.....	.....	.....	3.34	8.25	4.35	...	5.14	8.090	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JUNE, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....29.878 at 8 a.m. on 22nd.
Lowest Barometer.....29.184 at 4 p.m. on 30th. } Monthly range= 0.694

Self-registering Ther.
- Maximum temperature .....88°4 on 18th.
- Minimum temperature .....50°0 on 2nd. } Monthly range= 38°4
- Mean maximum temperature.....76°39
- Mean minimum temperature.....57°38 } Mean daily range= 19°01
- Greatest daily range.....31°8 from a.m. to p.m. of 17th.
- Least daily range..... 5°8 from a.m. to p.m. of 10th.

Warmest day..... 28th; mean temperature 77°70
Coldest day ..... 10th; mean temperature 57°43 } Difference=20°27

Maximum { Solar.....104°0 on 26th. } Monthly range=
Radiation { Terrestrial.....41°0 on 21st. } 63°0

Aurora observed on 7 nights, viz.: 3rd, 15th, 18th, 19th, 20th, 24th & 27th.

Possible to see aurora on 21 nights; impossible on 9 nights.

Raining on 16 days; depth, 8.090 inches; duration of fall, 50.7 hours.

Mean of cloudiness=0.51.

WIND.

Resultant direction, N. 17° E.; Resultant velocity, 0.40.

Mean velocity, 5.14 miles per hour.

Maximum velocity, 25.0 miles, from 3 to 4 a.m. of 20th.

Most windy day, 20th; mean velocity, 11.52 miles per hour.

Least windy day, 2nd; mean velocity, 0.00 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 8.41 miles per hour.

Least windy hour, 4 a.m.; mean velocity, 3.01 miles per hour.

Thunder storms on 4th, 5th, 8th, 10th, 13th, 19th, 20th, 25th, 26th, 27th, 28th & 30th.

Fog on 6th, 24th & 25th.

Dew recorded on 13 mornings.

It will be seen from the comparative table that June 1870 stands unequalled with regard to heat and moisture: the temperature being 5°9 above the average, and the amount of rain is nearly twice the usual quantity.

COMPARATIVE TABLE FOR JUNE.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1842	55.6	— 5.8	80.2	28.1	52.1	15	5.755	...	...	...	...	0.31 lbs
1843	58.4	— 3.0	83.3	28.2	55.1	12	4.595	...	...	...	...	0.27
1844	59.9	— 1.5	83.3	33.2	50.1	9	3.535	...	...	...	...	0.19
1845	61.0	— 0.4	84.6	38.5	46.1	11	3.715	...	...	...	...	0.27
1846	63.3	+ 1.9	84.2	39.1	45.1	10	1.920	...	...	...	...	0.32
1847	58.4	— 3.0	77.8	36.7	41.1	14	2.625	...	...	...	...	0.30
1848	62.9	+ 1.5	92.0	37.4	54.6	8	1.810	...	...	N 61 W	1.90	4.51 m.
1849	63.2	+ 1.8	84.4	35.2	49.2	7	2.020	...	...	S 71 E	0.49	3.32
1850	64.3	+ 2.9	85.6	34.2	51.4	10	3.345	...	...	S 60 W	0.38	4.54
1851	59.2	— 2.2	79.2	37.0	42.2	11	2.695	...	...	S 2 W	1.26	4.42
1852	60.8	— 0.6	86.1	37.2	48.9	10	3.160	...	...	S 76 W	1.49	4.09
1853	65.5	+ 4.1	89.5	39.2	50.3	9	1.550	...	...	N 1 W	0.10	3.73
1854	64.1	+ 2.7	92.5	35.2	57.3	9	1.460	...	...	N 24 E	0.71	4.15
1855	59.9	— 1.5	91.5	36.2	55.3	17	4.070	...	...	N 69 W	1.33	5.70
1856	62.1	+ 0.7	89.2	42.0	47.2	13	3.200	...	...	S 21 W	0.90	5.30
1857	56.9	— 4.5	76.0	35.0	41.0	21	5.060	...	...	N 49 W	1.15	7.60
1858	66.2	+ 4.8	90.2	42.5	47.7	12	2.943	...	...	S 20 E	0.25	5.53
1859	58.3	— 3.1	86.4	32.2	54.2	16	4.085	2	inap.	N 77 E	1.95	7.19
1860	63.2	+ 1.8	81.6	49.2	32.4	14	2.136	...	...	N 44 W	3.13	7.61
1861	61.3	— 0.1	87.8	41.6	46.2	13	2.329	...	...	N 39 W	2.29	6.11
1862	60.5	— 0.9	85.4	39.4	46.0	10	1.007	...	...	N 26 W	1.77	5.98
1863	60.1	— 1.3	84.8	37.4	47.4	13	1.662	...	...	N 50 W	2.26	5.24
1864	63.0	+ 1.6	93.4	34.8	58.6	5	0.570	...	...	N 55 W	1.72	4.53
1865	64.5	+ 3.1	90.2	43.0	47.2	7	2.005	...	...	S 30 W	0.60	4.06
1866	60.2	— 1.2	90.5	40.0	50.5	15	2.720	...	...	S 15 W	0.71	5.09
1867	64.3	+ 2.9	88.6	44.0	44.6	8	0.885	...	...	S 84 E	0.48	4.13
1868	62.0	+ 0.6	84.2	38.0	46.2	11	2.217	...	...	N 16 E	0.85	5.26
1869	58.4	— 3.0	81.4	36.4	45.0	22	4.373	...	...	N 80 W	1.77	5.23
1870	67.3	+ 5.9	88.4	50.0	38.4	16	8.090	...	...	N 17 E	0.40	5.14
Results to 1869.	61.43	.....	85.85	37.53	48.32	11.73	2.796	...	...	N 63 W	0.82	5.15
Excess for 1870.	+ 5.86	.....	+ 2.55	+ 12.47	— 9.92	+ 4.27	+ 5.294	...	...	...	...	— 0.01

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JULY, 1870.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6. A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10P.M.	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Re-sult'.	MEN.		
					°	°	°	°	°												°							
1	29.458	29.567	29.619	29.5527	60.9	67.7	57.6	61.95	— 4.37	.414	.388	.364	.374	78	57	76	68	N N E	E b S	Calm.	N 63 E	8.0	7.0	0.0	3.37	4.35	...	...
2	.634	.633	.605	.6267	61.6	68.4	60.5	63.92	— 2.58	.311	.290	.337	.305	56	41	64	52	N E b N	E	Calm.	N 61 E	3.4	7.5	0.0	3.38	3.96	...	...
3	—	.582	—	—	—	72.0	—	—	—	—	.541	—	—	—	69	—	—	N b E	S b E	S E	S 21 E	3.3	8.6	0.5	1.85	2.07	...	...
4	.540	.480	.463	.4805	64.8	76.7	64.8	68.67	+ 1.78	.528	.609	.528	.551	86	66	86	79	Calm.	S E b S	N W b N	S 3 W	0.0	6.6	8.0	0.69	4.40	0.372	...
5	.498	.508	.556	.5193	66.3	74.6	64.1	69.58	+ 2.52	.456	.592	.435	.519	70	69	73	70	S W	S	Calm.	S 37 W	0.6	7.0	0.0	2.95	3.94	...	...
6	.568	.538	.423	.5065	64.8	74.6	68.8	70.23	+ 2.93	.476	.581	.557	.537	77	67	79	72	N W b W	S b E	E b N	S 86 E	1.8	4.6	6.0	1.93	4.43	.020	...
7	.299	.185	.224	.2417	66.6	67.4	64.1	65.73	— 1.63	.599	.603	.524	.565	92	89	87	89	Calm.	S E b S	W b S	S 85 W	0.0	3.5	9.4	2.24	3.12	.320	...
8	.388	.471	.541	.4737	59.8	70.2	58.7	63.27	— 4.27	.428	.342	.339	.359	83	45	69	63	N W b N	W N W	Calm.	N 54 W	3.2	8.6	0.0	6.11	6.18	...	...
9	.589	.581	.617	.6008	59.4	75.7	63.7	66.52	— 1.15	.398	.451	.479	.448	78	81	70	76	Calm.	S W	S W	S 46 W	0.0	5.8	1.2	3.41	3.53	...	...
10	—	.627	—	—	—	77.8	—	—	—	—	.535	—	—	—	56	—	—	S W	S S W	Calm.	S 32 W	0.3	10.8	0.0	3.27	3.35	...	...
11	.621	.543	.371	.4983	64.5	69.5	65.2	66.87	— 1.03	.519	.617	.523	.564	85	86	84	86	E N E	E S E	E	N 62 E	0.5	4.6	6.4	2.63	4.86	.630	...
12	.443	.389	.441	.4187	65.2	68.8	65.2	68.08	+ 0.08	.563	.612	.510	.556	90	88	81	81	S W b S	S W b W	S W b W	S 61 W	4.5	6.8	2.8	4.93	5.62	.010	...
13	.443	.396	.396	.4130	63.4	76.0	68.4	70.42	+ 2.33	.483	.639	.533	.564	82	71	77	76	S W b S	S W	N b W	S 72 W	0.5	9.4	5.2	2.87	5.89	...	...
14	.436	.497	.545	.4980	61.6	72.8	61.6	65.93	— 2.25	.405	.462	.334	.409	74	57	61	64	N W b N	S b W	N W b N	N 58 W	3.8	7.8	9.8	2.02	4.89	...	...
15	.582	.633	.651	.6258	55.8	65.6	58.7	60.75	— 7.50	.322	.363	.419	.379	72	57	85	71	N N W	S S W	N b W	N 85 W	3.0	4.2	2.6	1.13	3.12	.010	...
16	.590	.523	.479	.5257	61.9	67.0	66.3	65.78	— 2.50	.451	.581	.603	.548	82	87	93	86	N E	S E b S	Calm.	N 7 E	3.0	1.2	0.0	1.19	3.37	.150	...
17	—	.565	—	—	—	84.7	—	—	—	—	.580	—	—	—	48	—	—	N W	S S E	W N W	S 62 W	3.3	5.6	8.0	2.63	4.50	inap.	...
18	.547	.512	.543	.5377	69.5	81.1	72.8	74.28	+ 5.90	.632	.760	.546	.657	88	71	67	77	S W	S W b S	N b W	N 71 W	4.5	9.6	6.0	2.45	5.88	...	...
19	.578	.594	.562	.5765	70.2	81.8	69.2	73.92	+ 5.50	.565	.622	.607	.580	76	57	85	70	N b E	S E b E	E b S	S 79 E	7.0	5.6	1.0	2.88	3.12	...	...
20	.552	.476	.494	.5102	68.4	81.1	74.6	74.70	+ 6.25	.590	.727	.672	.670	85	68	79	78	Calm.	S S W	W b S	S 50 W	0.0	9.6	18.4	6.29	7.71	.110	...
21	.620	.677	.711	.6722	64.8	76.7	64.8	68.78	+ 0.32	.425	.356	.435	.393	69	38	71	58	N W b W	N W b N	N	N 24 W	8.2	13.5	4.0	7.05	7.43	...	...
22	.701	.603	.557	.6162	63.4	72.8	69.9	70.30	+ 1.83	.404	.559	.642	.558	69	70	88	75	N	S E b S	W S W	S 20 W	3.2	10.8	1.4	3.87	5.42	.010	...
23	.572	.557	.548	.5620	73.5	84.7	71.7	75.65	+ 7.18	.667	.850	.588	.663	81	72	76	74	N b W	S S W	Calm.	S 13 W	7.6	9.0	0.0	4.57	5.62	...	...
24	—	.498	—	—	—	71.3	—	—	—	—	.667	—	—	—	88	—	—	S S E	S W b W	S W b W	S 50 W	2.2	2.8	1.8	4.53	4.98	.045	...
25	.620	.630	.697	.6498	69.2	80.7	69.2	74.88	+ 6.47	.665	.748	.537	.595	93	71	75	70	W S W	S b W	Calm.	N 62 W	0.5	7.4	0.0	1.56	3.99	...	...
26	.701	.600	.487	.5888	65.5	77.8	72.0	72.62	+ 4.25	.546	.739	.687	.645	87	77	88	81	N N W	S W b S	N N E	S 60 W	0.6	6.0	4.6	0.80	3.23	.145	...
27	.565	.598	.553	.5667	70.6	72.8	68.4	71.55	+ 3.18	.706	.726	.662	.704	94	90	96	91	W N W	S S W	S S E	S 6 W	0.6	3.0	0.5	1.09	1.66	.030	...
28	.490	.405	.352	.4102	68.4	78.9	71.7	72.17	+ 3.87	.668	.708	.617	.632	96	71	79	80	S b E	S S W	N b W	S 67 W	0.8	5.8	6.8	3.82	6.09	inap.	...
29	.400	.463	.593	.4907	60.9	68.8	59.8	63.93	— 4.30	.426	.475	.392	.446	80	67	76	75	W	N W	N W b W	N 59 W	9.4	15.4	4.2	10.24	10.43	.010	...
30	.652	.695	.723	.7015	60.9	76.4	66.6	68.02	— 0.18	.438	.374	.326	.386	82	41	49	57	N W b W	N W b N	N b W	N 44 W	2.0	10.4	8.8	5.14	6.60	...	...
31	—	.663	—	—	—	74.2	—	—	—	—	.526	—	—	—	62	—	—	S W b W	S S W	S W	S 32 W	2.8	13.0	2.7	5.40	5.65	.034	...
	29.5418	29.5290	29.5291	29.5332	64.69	74.18	66.09	68.79	+ 0.88	.503	.568	.508	.523	81	66	78	74	.....	.....	.....	.....	2.86	7.47	3.91	.....	4.82	1.896	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JULY, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.773 at 8 a.m. on 31st. } Monthly range=
Lowest Barometer.....29.185 at 2 p.m. on 7th. } 0.588.

Self-registering Ther.
- Maximum Temperature .....87°4 on 23rd. } Monthly range=
- Minimum Temperature .....48°0 on 15th. } 39°4.
- Mean Maximum Temperature .....77°67. } Mean daily range=
- Mean Minimum Temperature .....59°98. } 17°69.
- Greatest daily range.....24°0 from a.m. to p.m. of 9th.
- Least daily range ..... 4°8 from a.m. to p.m. of 7th.

Warmest day.....23rd...Mean Temperature.....75°65. } Difference=14°90.
Coldest day .....15th...Mean Temperature.....60°75. }

Maximum Radiation. Solar .....101°5 on 23rd. Terrestrial ... . 37°4 on 15th. } Monthly range= 64°1.

Aurora observed on 4 nights, viz.: 5th, 18th, 27th and 30th.

Possible to see Aurora on 20 nights; impossible on 11 nights.

Raining on 16 days; depth 1.896 inches; duration of fall 38.8 hours.

Mean of Cloudiness=0.58.

WIND.

Resultant Direction S. 78° W.; Resultant Velocity 1.59.

Mean Velocity 4.82 miles per hour.

Maximum Velocity 30.0 miles, from 9 to 10 a.m. of 29th.

Most Windy day 29th; Mean Velocity 10.43 miles per hour.

Least Windy day 27th; Mean Velocity 1.66 miles per hour.

Most Windy hour 3 p.m; Mean Velocity 7.68 miles per hour.

Least Windy hour 5 a.m.; Mean Velocity 2.26 miles per hour.

Fog recorded on 4 occasions, 16th, 25th, 27th and 28th.

Dew on 10 mornings.

Thunder and lightning on 11 days.

The storm on the 20th was long protracted, and was accompanied by a violent gust of wind for about 1 hour. This storm was very generally felt throughout Canada.

COMPARATIVE TABLE FOR JULY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1842	64.7	— 2.6	91.0	42.5	48.5	4	3.050	...	...	...	...	0.33 lbs
1843	64.5	— 2.8	86.8	38.7	48.1	8	4.605	...	...	...	...	0.44
1844	66.0	— 1.3	86.6	40.1	46.5	12	2.815	...	...	...	...	0.19
1845	66.2	— 1.1	95.0	45.7	49.3	7	2.195	...	...	...	...	0.30
1846	68.0	+ 0.7	94.6	44.5	50.1	9	2.895	...	...	...	...	0.29
1847	68.0	+ 0.7	87.0	43.2	43.8	8	3.355	...	...	...	...	0.19
1848	65.5	— 1.8	82.2	44.1	38.1	10	1.890	...	...	N 14 W	0.18	4.94mls
1849	68.4	+ 1.1	88.6	45.2	43.4	4	3.415	...	...	S 5 W	0.75	3.52
1850	68.9	+ 1.6	86.2	51.6	34.6	12	5.270	...	...	N 81 E	0.59	4.56
1851	65.0	— 2.3	82.7	46.5	36.2	12	3.625	...	...	N 60 W	0.88	4.13
1852	66.8	— 0.5	90.1	48.5	41.6	8	4.025	...	...	N 43 W	0.93	3.33
1853	65.6	— 1.7	91.3	41.6	49.7	10	0.915	...	...	S 58 E	0.24	3.69
1854	72.5	+ 5.2	98.0	42.5	55.5	9	4.805	...	...	S 49 W	0.37	4.03
1855	67.9	+ 0.6	92.8	49.2	43.6	13	3.245	...	...	S 19 W	0.73	6.47
1856	69.9	+ 2.6	96.6	49.5	47.1	8	1.120	...	...	N 79 W	1.57	5.84
1857	67.8	+ 0.5	86.6	47.0	39.6	15	3.475	...	...	S 68 E	0.81	4.74
1858	67.9	+ 0.6	85.0	52.0	33.0	13	3.072	...	...	N 15 E	1.13	5.76
1859	66.9	— 0.4	88.0	44.7	43.3	12	2.611	...	...	N 56 W	1.48	5.81
1860	63.9	— 3.4	88.0	43.8	44.2	13	4.336	...	...	N 60 W	2.15	7.29
1861	65.4	— 1.9	84.5	47.0	37.5	16	2.635	...	...	N 74 W	1.43	4.66
1862	66.7	— 0.3	95.5	48.2	47.3	15	5.344	...	...	S 89 W	1.42	5.80
1863	67.6	+ 0.3	83.5	48.0	35.5	15	3.408	...	...	N 18 W	0.40	3.89
1864	69.7	+ 2.4	90.2	49.0	41.2	8	1.332	...	...	N 61 W	2.23	6.00
1865	65.0	— 2.3	83.0	45.8	37.2	11	2.470	...	...	N 86 W	2.28	5.34
1866	70.4	+ 3.1	94.0	47.8	46.2	16	5.390	...	...	S 79 W	0.94	4.17
1867	68.2	+ 0.9	94.0	48.2	45.8	12	1.965	...	...	N 48 W	1.40	5.45
1868	75.8	+ 8.5	96.4	59.0	34.4	5	0.510	...	...	S 87 E	0.72	4.66
1869	64.5	— 2.8	84.9	49.8	35.1	13	4.610	...	...	S 67 W	2.01	5.07
1870	68.8	+ 1.5	87.4	48.0	39.4	16	1.896	...	...	S 78 W	1.59	4.82
Results to 1869.	67.3	...	89.29	46.56	42.73	10.47	3.393	.....	.....	N 73 W	0.71	4.96
Excess for '70	+ 1.51	...	— 1.89	+ 1.44	— 3.33	+ 5.53	— 1.497	.....	.....	...	...	— 0.14

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—AUGUST, 1870.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°												°						
1	29.588	29.523	29.538	29.5485	63.0	78.9	67.0	71.02	+ 2.95	.513	.615	.486	.537	89	62	73	72	S W	S S W	N N W	N 64 W	3.0	5.8	7.0	3.18	6.26	...	...
2	.571	.566	.541	.5538	63.0	72.0	64.5	67.35	— 0.67	.437	.527	.467	.476	75	66	76	71	N b W	S S E	N E b E	S 63 E	5.6	3.4	4.2	2.25	3.78	.040	...
3	.523	.401	.448	.4437	62.3	78.5	66.3	69.33	+ 1.42	.522	.762	.445	.544	93	78	68	75	W b N	S W b S	N W	N 75 W	3.0	8.6	5.0	3.79	6.49	.240	...
4	.503	.487	.445	.4763	56.9	74.9	64.5	66.87	— 0.98	.362	.435	.442	.417	78	50	73	64	N W	S S W	S W	N 77 W	5.2	7.2	6.4	4.53	7.02	...	...
5	.431	.368	.443	.4145	63.4	77.5	63.7	68.73	+ 0.98	.494	.570	.557	.564	84	60	94	80	W N W	S S E	S W	S 45 W	4.2	9.2	0.8	2.52	4.46	1.490	...
6	.428	.419	.503	.4550	64.1	79.6	71.7	71.68	+ 4.02	.565	.652	.546	.582	94	64	70	76	E S E	S S W	N	S 23 W	1.6	10.8	4.0	3.44	4.85	...	...
7	—	.593	—	—	—	77.8	—	—	—	—	.342	—	—	—	36	—	—	N	E b N	E N E	N 52 E	2.9	4.2	4.1	4.32	4.75	.590	...
8	.503	.518	.584	.5400	68.4	81.1	71.7	73.07	+ 5.63	.646	.705	.741	.698	93	70	95	86	E N E	S S W	Calm.	S 35 W	2.4	13.6	0.0	3.24	4.06	.205	...
9	.626	.606	.638	.6280	69.9	78.5	69.9	72·82	+ 5.50	.670	.649	.612	.645	92	66	84	80	W b N	N W b N	S W b W	N 73 W	2.0	9.4	5.5	1.84	2.86	inap.	...
10	.701	.700	.694	.6985	64.5	78.2	69.5	71.93	+ 4.77	.532	.589	.561	.568	88	62	77	74	N E b E	S S E	N E b N	S 18 E	1.2	5.2	4.6	1.01	3.38	...	...
11	.735	.702	.657	.6943	63.0	76.7	69.5	71.67	+ 4.62	.500	.451	.465	.460	86	49	64	60	N	E	E b N	N 61 E	3.0	6.0	1.6	3.08	4.09	...	...
12	.650	.645	.741	.6792	67.4	81.4	56.5	68.38	+ 1.48	.547	.546	.291	.469	82	51	64	67	W N W	W N W	N W	N 68 W	3.2	17.2	0.6	7.46	7.81	...	...
13	.763	.715	.645	.6997	59.0	65.2	58.0	60.37	— 6.38	.439	.432	.405	.421	88	70	84	80	N W	S W b S	S W b S	N 89 W	3.4	5.8	5.0	3.08	4.34	.020	...
14	—	.633	—	—	—	74.6	—	—	—	—	.579	—	—	—	67	—	—	N W	N W	N W b N	N 40 W	12.6	11.5	7.9	9.87	10.44	...	...
15	.704	.675	.608	.6550	56.9	69.9	64.1	65.13	— 1.30	.351	.527	.410	.433	76	72	68	69	N W b N	S	N b W	S 75 E	1.6	7.0	4.0	1.53	4.89	...	...
16	.588	.473	.413	.4808	57.6	75.3	65.9	66.52	+ 0.27	.376	.455	.436	.424	79	52	68	66	N b W	S b W	S W	S 20 W	5.0	6.4	2.4	3.98	4.46	...	...
17	.376	.275	.312	.3153	63.7	76.7	71.0	70.47	+ 4.40	.452	.522	.485	.486	76	56	64	66	S W b W	S W b S	S W b S	S 35 W	3.0	18.8	9.0	10.31	10.35	inap.	...
18	.473	.516	.534	.5090	65.2	78.9	66.6	70.67	+ 4.75	.497	.630	.557	.572	80	64	85	77	S W	S E b S	S S W	S 25 E	2.0	7.5	1.6	2.78	3.52	...	...
19	.535	.475	.487	.4997	64.8	77.8	73.1	72.38	+ 6.70	.569	.613	.770	.638	93	64	95	81	S S E	S S W	W	S 74 W	2.2	13.0	9.4	5.76	10.77	.080	...
20	.718	.795	.839	.7925	54.7	69.9	58.0	60.92	— 4.58	.337	.270	.314	.295	78	37	65	58	N W b W	N b W	N W b N	N 22 W	4.5	13.4	9.2	7.63	7.88	...	...
21	—	.885	—	—	—	69.5	—	—	—	—	.440	—	—	—	61	—	—	N N W	W b S	N b W	N 14 W	4.4	4.0	6.3	4.73	5.23	...	...
22	.924	.867	.801	.8633	52.6	68.1	60.5	61.67	— 3.38	.353	.445	.303	.381	89	65	58	69	N N W	S b W	S W b W	N 79 W	2.8	6.6	3.5	2.72	4.97	...	...
23	.730	.642	.510	.6197	60.1	64.5	63.4	62.67	— 2.18	.376	.467	.521	.463	72	76	89	81	W b N	E b N	E b N	N 80 E	3.0	5.6	14.4	6.48	7.25	.135	...
24	.474	.451	.417	.4493	64.1	73.1	65.9	67.70	+ 3.10	.578	.672	.581	.612	96	83	91	91	E b N	E	N	N 73 E	3.6	8.8	4.3	4.01	4.79	.065	...
25	.361	.345	.651	.4672	67.0	76.0	60.9	69.70	+ 5.25	.553	.812	.366	.530	83	91	68	72	N	S W b S	N W b N	N 54 W	2.6	7.0	17.0	10.54	13.49	.402	...
26	.825	.922	.941	.9102	49.0	64.1	50.8	54.80	— 9.30	.264	.211	.201	.227	76	35	54	55	N N W	N N W	N b W	N 16 W	4.8	11.0	2.2	7.33	7.41	...	...
27	.968	.906	.785	.8760	48.2	64.8	53.6	57.53	— 6.30	.216	.219	.340	.304	64	46	82	65	N b W	S S E	S E b E	S 85 E	4.8	2.8	1.8	1.59	3.27	...	...
28	—	.614	—	—	—	68.8	—	—	—	—	.528	—	—	—	75	—	—	N N E	S E b E	Calm.	S 85 E	3.1	2.2	0.0	1.03	1.33	.130	...
29	.401	.226	.407	.3457	63.4	76.4	61.9	67.25	+ 3.95	.574	.709	.425	.570	98	78	76	84	Calm	S S W	W b S	S 46 W	0.0	15.4	0.6	6.08	7.13	.025	...
30	.535	.553	.553	.5495	53.6	72.0	59.1	63.17	+ 0.10	.351	.318	.402	.380	85	40	80	68	W b S	W b S	S W	S 72 W	4.0	16.0	2.0	6.35	6.55	...	...
31	.524	.530	.596	.5448	59.4	76.7	65.2	68.13	+ 5.33	.446	.496	.422	.480	88	54	68	70	S W b W	W	N	N 74 W	3.5	9.8	6.0	3.36	5.74	...	...
M	29.5984	29.5667	29.5826	29.5818	60.93	74.32	64.18	67.10	+ 1.14	.464	.533	.465	.488	84	62	75	72	.....	.....	.....	.....	3.49	8.65	4.53	.....	5.92	3.422	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR AUGUST, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.977 at 8 a.m. on 27th. } Monthly range=
Lowest Barometer .....29.224 at 4 p.m. on 29th. } 0.753 inches.

Self-registering Ther.
- Maximum temperature .....84°0 on 1st. } Monthly range=
- Minimum temperature.....40°0 on 27th. } 44°0
- Mean maximum temperature .....76°86 } Mean daily range=
- Mean minimum temperature .....57°12 } 19°74
- Greatest daily range .....30°8 from a.m. to p.m. of 27th.
- Least daily range ..... 8°4 from a.m. to p.m. of 23rd.

Warmest day..... 8th; mean temperature.....73°07 } Difference=18°27.
Coldest day.....27th; mean temperature.....54°80 }

Maximum Radiation { Solar.....100°0 on 12th. } Monthly range=
Terrestrial..... 30°2 on 27th. } 69°8.

Aurora observed on 12 nights, viz.:—18th, 19th, 20th, 22nd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, and 31st.

Possible to see Aurora on 26 nights; impossible on 5 nights.

Raining on 14 days; depth, 3.422 inches; duration of fall, 36.0 hours.

Mean of cloudiness=0.48.

WIND.

Resultant direction, N. 75° W.; resultant velocity, 1.80.

Mean velocity, 5.92 miles per hour.

Maximum velocity, 26.1 miles, from 11 p.m. to midnight of 19th.

Most windy day, 25th; mean velocity, 13.49 miles per hour.

Least windy day, 28th; mean velocity, 1.33 miles per hour.

Most windy hour, 2 p.m.; mean velocity, 9.64 miles per hour.

Least windy hour, 5 a.m.; mean velocity, 3.35 miles per hour.

Solar haloes on 2nd and 24th. Lunar haloes on 6th and 8th.

Fog on 6 occasions. Dew on 6 mornings.

Hoar frost at 5 a.m. of 27th.

Thunder storms on 5th, 8th, 24th, 28th and 29th. Lightning on 1st, 3rd, 4th, 20th, 28th and 30th.

COMPARATIVE TABLE FOR AUGUST.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1842	65.7	— 0.3	81.8	43.9	37.9	6	2.500	...	...	...	...	0.30 lbs.
1843	66.4	+ 0.4	83.1	44.0	39.1	4	4.850	...	...	...	...	0.12
1844	64.3	— 1.7	86.8	43.5	43.3	17	impr.	...	...	...	...	0.16
1845	67.9	+ 1.9	84.8	41.5	43.3	9	1.725	...	...	...	...	0.19
1846	68.4	+ 2.4	86.4	49.5	36.9	9	1.770	...	...	...	...	0.17
1847	65.1	— 0.9	82.6	44.6	38.0	10	2.140	...	...	...	...	0.19
1848	69.2	+ 3.2	87.0	48.7	38.3	8	0.855	...	...	S 21 E	0.98	4.55 mls.
1849	66.3	+ 0.3	79.0	49.0	30.0	10	3.970	...	...	N 71 W	0.60	3.76
1850	66.8	+ 0.8	85.0	41.0	44.0	13	4.355	...	...	N 15 E	0.35	4.46
1851	63.6	— 2.4	79.8	42.0	37.8	10	1.360	...	...	N 63 W	0.40	4.63
1852	65.9	+ 0.1	81.2	45.8	35.4	9	2.695	...	...	N 70 E	0.56	3.30
1853	68.6	+ 2.6	94.9	42.5	52.4	11	2.575	...	...	S 36 E	0.30	4.26
1854	68.0	+ 2.0	99.2	45.6	53.6	5	0.455	...	...	N 64 W	1.76	4.60
1855	64.1	— 1.9	83.5	40.0	43.5	7	1.455	...	...	N 63 W	1.04	6.97
1856	63.6	— 2.4	82.7	41.5	41.2	12	1.680	...	...	N 50 W	2.88	7.03
1857	65.3	— 0.7	88.2	46.0	42.2	13	5.265	...	...	N 77 W	1.51	6.36
1858	67.6	+ 1.6	84.0	44.0	40.0	11	3.890	...	...	N 69 W	1.57	6.50
1859	66.6	+ 0.6	82.2	45.8	36.4	11	3.900	...	...	N 36 W	1.62	5.96
1860	64.5	— 1.5	87.0	46.8	40.2	14	3.405	...	...	N 70 W	1.83	5.80
1861	65.5	— 0.5	85.2	47.0	38.2	15	2.953	...	...	N 8 E	0.46	4.21
1862	67.6	+ 1.6	89.5	42.8	46.7	15	3.483	...	...	N 78 W	1.67	5.96
1863	66.6	+ 0.6	88.0	42.4	45.6	12	2.208	...	...	S 61 W	1.80	4.89
1864	68.6	+ 2.6	94.0	47.0	47.0	16	5.060	...	...	N 70 W	1.38	4.75
1865	65.2	— 0.8	87.8	44.4	43.4	8	1.990	...	...	N 60 W	1.55	5.07
1866	60.8	— 5.2	77.0	42.4	34.6	14	4.457	...	...	N 59 W	2.58	5.16
1867	68.1	+ 2.1	95.2	42.2	53.0	10	2.440	...	...	N 76 W	1.25	4.52
1868	67.2	+ 1.2	84.4	46.8	37.6	13	1.562	...	...	S 58 W	1.01	6.15
1869	63.6	— 2.4	89.0	43.5	45.5	11	4.273	...	...	S 42 W	1.98	5.13
1870	67.1	+ 1.1	84.0	40.0	44.0	14	3.422	...	...	N 75 W	1.80	5.92
Results to 1869.	66.0	.....	86.05	44.44	41.61	10.80	3.015	...	...	N 66 W	1.07	5.18
Exc. for 1870.	+ 1.1	.....	— 2.05	— 4.44	+ 2.39	+ 3.20	+ 0.407	...	...	...	...	+ 0.74

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—SEPTEMBER, 1870.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°																		
1	29.579	29.503	29.483	29.5187	61.9	75.6	65.6	68.80	+ 6.25	.401	.595	.531	.515	73	67	85	73	N E b N	S E b S	S W	S 3 E	3.4	10.5	2.5	3.03	5.86	...	...
2	.477	.430	.491	.4617	65.2	75.7	61.9	68.13	+ 5.88	.523	.638	.464	.544	84	72	84	79	N	S S W	N N W	N 26 W	1.5	2.0	6.4	3.43	6.67	...	...
3	.510	.431	.384	.4397	58.3	60.9	59.8	59.78	+ 2.20	.412	.465	.451	.447	85	87	88	87	N b W	N	N b W	N 15 W	1.7	5.6	10.4	7.47	7.95	.725	...
4	—	.396	—	—	—	66.3	—	—	—	—	.407	—	—	—	52	—	—	N W b W	N W b W	N W	N 46 W	11.2	19.8	9.0	8.80	8.93	...	...
5	.681	.719	.775	.7293	52.6	65.9	56.2	59.12	— 2.27	.353	.411	.350	.375	89	64	77	75	Calm.	S b W	Calm.	S 86 W	0.0	6.2	0.0	1.26	2.40	...	...
6	.844	.817	.809	.8237	53.6	67.7	60.9	61.10	+ 0.05	.340	.476	.441	.422	82	70	82	78	Calm.	S E b S	E	S 49 E	0.0	0.6	0.5	0.91	1.09	.285	...
7	.815	.819	.854	.8323	60.5	68.1	61.6	63.63	+ 2.92	.496	.511	.519	.499	94	75	95	85	N E b E	E S E	N E b E	N 74 E	2.2	8.8	4.4	5.33	6.06	.200	...
8	.881	.865	.795	.8418	61.6	70.6	61.9	65.36	+ 4.95	.493	.546	.503	.519	90	73	90	83	N E	E b N	N E b E	N 70 E	7.2	8.2	2.4	4.55	4.86	...	...
9	.787	.698	.709	.7212	63.4	74.6	65.2	68.45	+ 8.47	.533	.718	.550	.600	91	84	89	87	N	S S E	N N W	N 16 W	1.6	2.0	5.0	2.89	4.73	.510	...
10	.741	.807	.855	.8108	60.1	68.4	54.4	61.03	+ 1.43	.448	.290	.255	.325	86	41	60	61	N	N	N b E	N 7 E	7.5	11.0	2.2	7.07	7.14	...	...
11	—	.910	—	—	—	62.3	—	—	—	—	.335	—	—	—	60	—	—	N b E	S b E	N b W	N 7 W	4.3	5.2	6.6	1.84	3.37	...	...
12	.958	.950	.947	.9535	50.0	64.8	54.7	57.58	— 1.23	.335	.262	.325	.342	93	58	76	73	N N W	S S E	N E	N 74 E	3.6	9.2	4.6	2.22	5.60	...	...
13	.973	.932	.903	.9323	50.0	65.6	56.2	58.95	+ 0.53	.274	.213	.360	.302	75	34	80	63	N N E	E b N	N E b N	N 59 E	7.8	7.0	5.4	4.36	5.13	...	...
14	.891	.819	.751	.8108	53.6	68.4	61.6	62.42	+ 4.40	.340	.428	.481	.435	82	61	87	77	N E b N	S E b E	E N E	N 87 E	6.0	4.6	2.0	3.15	3.75	...	...
15	.714	.637	.663	.6663	61.6	73.5	64.8	67.23	+ 9.62	.481	.608	.582	.568	87	74	95	86	N E	S S W	Calm.	S 39 W	1.5	5.6	0.0	0.74	3.20	2.285	...
16	.703	.771	.821	.7710	61.9	60.5	58.3	60.12	+ 2.90	.529	.442	.412	.464	95	84	84	88	W	E N E	N E b N	N 48 E	1.2	6.6	4.8	5.30	5.77	.230	...
17	.833	.798	.818	.8178	55.1	66.6	63.0	61.52	+ 4.73	.375	.465	.475	.442	86	71	82	80	N b E	N E	N b W	N 19 E	5.0	5.5	2.0	4.28	5.35	..	...
18	—	.803	—	—	—	70.6	—	—	—	—	.311	—	—	—	41	—	—	N	N	N	N 2 E	9.4	14.2	8.5	8.38	8.73	...	...
19	.925	.923	.919	.9220	50.8	63.0	50.0	55.98	+ 0.05	.249	.326	.324	.308	64	57	89	69	N b E	S b W	S W b W	N 11 W	11.0	5.6	1.0	0.57	3.60	...	...
20	.944	.928	.925	.9325	49.0	68.4	54.7	59.17	+ 3.62	.287	.363	.294	.326	82	52	68	66	N b W	S b W	E N E	N 58 E	2.6	3.2	2.0	1.88	3.54	...	...
21	.943	.919	.939	.9302	52.9	69.5	58.3	60.97	+ 5.85	.360	.427	.401	.377	90	59	82	71	N E	S S E	E b S	S 61 E	5.3	6.8	3.4	2.29	3.83	...	...
22	.875	.827	.749	.8100	51.8	70.2	60.5	61.68	+ 7.00	.363	.496	.394	.435	94	67	74	79	N E b E	S S E	W b S	S 15 W	3.2	5.2	0.6	1.99	2.82	...	...
23	.705	.648	.624	.6557	56.9	71.3	65.6	64.90	+10.63	.374	.607	.599	.533	80	79	95	85	W b S	S W b W	W b S	S 68 W	3.2	2.4	1.0	1.41	1.70	.105	...
24	.618	.580	.575	.5890	61.9	63.0	60.9	62.12	+ 8.28	.528	.526	.491	.510	95	91	92	91	N W b W	Calm.	N N E	N 3 E	1.6	0.0	1.5	1.51	1.70	.850	...
25	—	.631	—	—	—	64.8	—	—	—	—	.450	—	—	—	73	—	—	N b E	N W b W	N b W	N 4 W	6.0	4.0	1.1	3.85	4.15	.150	...
26	.845	.819	.777	.8063	52.2	64.8	54.4	57.43	+ 4.45	.358	.476	.396	.408	92	77	93	86	N	S	W N W	N 88 W	7.0	4.0	1.6	0.54	3.59	...	...
27	.795	.721	.734	.7435	56.2	68.8	62.3	62.72	+10.12	.316	.528	.432	.434	70	75	77	75	N W b W	S	N	N 4 W	4.4	5.5	8.3	1.97	5.52	...	...
28	.771	.744	.739	.7487	52.2	61.2	55.1	56.65	+ 4.47	.305	.434	.398	.385	78	80	91	83	N E b N	E b N	N E	N 60 E	5.8	5.0	4.6	4.58	5.30	...	...
29	.731	.691	.684	.7007	55.1	64.8	64.5	61.75	+10.00	.398	.528	.560	.499	91	86	92	90	N N E	E b N	E N E	N 82 E	6.4	10.5	3.4	7.31	7.60	.254	...
30	.679	.572	.470	.5657	63.0	59.4	57.3	59.72	+ 8.33	.526	.470	.425	.466	91	93	90	91	S E b E	E	N N E	N 58 E	7.8	14.2	12.0	8.94	11.33	1.200	...
	29.7776	29.7449	29.7382	29.7514	56.59	67.36	59.60	61.78	+ 4.53	.400	.475	.439	.442	85	70	85	79	.....	.....	.....	.....	4.65	6.63	3.91	...	5.04	6.794	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR SEPTEMBER, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.001 at 10 a.m. on 13th.
Lowest Barometer.....29.413 at 4 p.m. on 3rd. } Monthly range= 0.588.

Self-registering Ther.

Maximum Temperature.....78°0 on 1st.
Minimum Temperature.....45°8 on 20th. } Monthly range= 32 2.
Mean Maximum Temperature.....69°17.
Mean Minimum Temperature.....54°27. } Mean daily range= 14°90.
Greatest daily range.....24°0 from a.m. to p.m. of 20th.
Least daily range.....3°0 from a.m. to p.m. of 24th.

Warmest day.....1st...Mean Temperature.....68°80.
Coldest day.....19th...Mean Temperature.....55°98. } Difference=12°82.

Maximum Radiation. { Solar.....94°5 on 2nd. } Monthly range= 57°1.
Terrestrial.....37°4 on 20th.

Aurora observed on 8 nights, viz.: 7th, 18th, 20th, 21st, 24th, 25th, 26th and 28th.
Possible to see Aurora on 21 nights; impossible on 9 nights.
Raining on 11 days; depth 6.794 inches; duration of fall 85.5 hours.
Mean of Cloudiness=0.53.

WIND.

Resultant Direction N. 29° E.; Resultant Velocity 2.26.
Mean Velocity 5.04 miles per hour.
Maximum Velocity 18.5 miles, from 8 to 9 a.m. of 4th.
Most Windy day 30th; Mean Velocity 11.33 miles per hour.
Least Windy day 6th; Mean Velocity 1.09 miles per hour.
Most Windy hour 1 p.m; Mean Velocity 7.23 miles per hour.
Least Windy hour 8 p.m.; Mean Velocity 3.90 miles per hour.

Lunar halo 5th. Lunar corona 7th.
Lightning alone on 1st, 2nd and 8th. Thunder storms 9th, 15th and 24th.
Very heavy rain storm, accompanied by thunder, 15th.
Fog on 16th, 22nd, 23rd, 26th and 29th.
Dew on 11 mornings during month.

COMPARATIVE TABLE FOR SEPTEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°							
1842	55.7	— 2.3	83.8	27.9	55.9	12	6.160	...	...	...	...	0.45 lbs
1843	59.1	+ 1.1	89.0	32.2	56.8	10	9.760	...	...	...	...	0.57
1844	58.6	+ 0.6	81.8	28.2	53.6	4	imper.	...	...	...	...	0.26
1845	56.0	— 2.0	79.6	34.0	45.6	16	6.245	...	...	...	...	0.34
1846	63.6	+ 5.6	84.3	37.3	47.0	11	4.595	...	...	...	...	0.33
1847	55.6	— 2.4	74.5	35.0	39.5	15	6.665	...	...	...	...	5.81mls
1848	54.2	— 3.8	80.4	28.1	52.3	11	3.115	...	...	N 71 W	2.38	4.23
1849	58.2	+ 0.2	80.1	32.7	47.4	9	1.480	...	...	N 75 W	0.69	4.78
1850	56.5	— 1.5	76.0	29.5	46.5	11	1.735	...	...	S 65 W	1.02	5.45
1851	60.0	+ 2.0	86.3	32.0	54.3	9	2.665	...	...	N 14 E	1.03	4.60
1852	57.5	— 0.5	81.8	35.8	46.0	10	3.630	...	...	N 77 W	0.53	4.33
1853	58.8	+ 0.8	85.5	33.9	51.6	12	5.140	...	...	N	1.06	4.04
1854	61.0	+ 3.0	93.6	35.8	57.8	14	5.375	...	...	N 22 W	1.33	7.61
1855	59.5	+ 1.5	82.6	33.0	49.6	12	5.585	...	...	N 20 E	1.29	6.53
1856	57.1	— 0.9	78.4	35.0	43.4	13	4.105	...	...	S 79 W	1.98	5.55
1857	58.6	+ 0.6	82.0	34.1	47.9	11	2.640	...	...	N 68 W	1.61	5.69
1858	59.1	+ 1.1	81.4	35.6	45.8	8	0.735	...	...	S 74 W	1.53	6.36
1859	55.2	— 2.8	75.4	35.7	39.7	15	3.525	...	...	N 44 W	1.60	5.79
1860	55.3	— 2.7	75.8	28.7	47.1	14	1.959	...	...	N 71 W	2.63	4.81
1861	59.1	+ 1.1	78.8	37.1	41.7	17	3.607	...	...	N 71 W	1.39	5.11
1862	59.6	+ 1.6	79.4	39.0	40.4	9	2.344	...	...	N 59 W	1.07	6.46
1863	55.9	— 2.1	80.0	31.4	48.6	8	1.235	...	...	N 16 W	0.92	7.06
1864	56.4	— 1.6	73.0	37.8	35.2	11	2.508	...	...	N 38 W	1.89	4.12
1865	64.5	+ 6.5	90.5	42.0	48.5	12	2.450	...	...	S 56 E	0.47	4.63
1866	55.2	— 2.8	80.0	34.4	45.6	15	5.657	...	...	N 33 W	1.45	5.43
1867	57.9	— 0.1	87.0	31.8	55.2	9	1.220	...	...	N 37 W	1.48	6.68
1868	56.6	— 1.4	75.5	36.0	39.5	16	4.239	...	...	N 74 W	0.88	4.89
1869	60.7	+ 2.7	81.0	34.4	46.6	8	4.027	...	...	N 53 W	1.16	5.48
1870	61.8	+ 3.8	78.0	45.8	32.2	11	6.794	...	...	N 29 E	2.26	5.04
Results to 1869.	58.03	...	81.34	33.87	47.47	11.17	3.694	.....	.....	N 56 W	1.07	5.45
Excess for '70	+ 3.75	...	— 3.34	+ 11.93	+ 15.27	— 0.17	+ 3.100	.....	.....	...	...	— 0.41

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—OCTOBER, 1870.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	0 PM	ME'N.		6 A.M	2 P.M.	10 P.M.	M'N.	6 A.M	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°													°						
1	29.533	29.613	29.693	29.6240	58.0	65.9	58.7	60.45	+ 9.47	.427	.461	.419	.439	89	72	85	83	N b W	NW	NE	N 17 E	8.0	2.6	1.0	2.84	3.58	...	...
2	—	.715	—	—	—	64.8	—	—	—	—	.503	—	—	—	81	—	—	N N E	E b N	N E	S 83 E	5.2	6.4	4.2	6.33	7.13	.380	...
3	.437	.286	.242	.3125	58.0	61.6	54.4	57.50	+ 7.27	.452	.481	.396	.436	94	88	93	92	S E b E	S E b S	W S W	S 23 E	20.0	4.0	1.6	4.26	6.97	.340	...
4	.260	.350	.538	.3990	54.7	59.8	54.7	56.77	+ 6.92	.392	.369	.392	.385	91	72	91	84	W S W	N W b N	N b E	N 11 W	2.4	10.0	8.6	7.56	8.50	...	...
5	.704	.788	.876	.7995	52.2	55.8	54.7	54.48	+ 4.97	.305	.300	.325	.316	78	67	76	74	N N E	N b E	N E b N	N 32 E	7.0	2.4	3.6	3.92	4.05	...	...
6	.941	.978	30.011	.9802	52.6	56.2	55.1	54.85	+ 5.72	.300	.305	.309	.311	75	67	71	72	N E b N	N E	N E	N 47 E	5.5	1.6	5.4	4.62	4.73	...	...
7	30.046	30.016	30.001	30.0222	45.7	56.2	48.6	50.52	+ 1.73	.249	.305	.312	.289	81	67	91	79	N N E	E S E	N b E	N 54 E	6.5	9.0	7.5	4.46	6.21	...	...
8	30.017	29.985	29.941	29.9753	41.0	62.7	52.9	52.75	+ 4.30	.237	.341	.296	.301	92	60	74	76	N N W	S W	N	N 49 W	6.0	5.0	3.3	2.85	4.82	...	...
9	—	.886	—	—	—	61.6	—	—	—	—	.368	—	—	—	67	—	—	N W	S b W	W S W	S 51 W	5.5	9.4	2.3	2.65	3.77	...	...
10	29.794	.702	.560	.6713	45.7	61.2	55.8	55.07	+ 7.25	.278	.374	.411	.371	90	69	93	85	W N W	S E b E	Calm.	S 62 E	1.0	6.4	0.0	1.26	1.74	.100	...
11	.390	.250	.286	.3058	56.9	65.6	55.5	59.18	+11.67	.431	.492	.369	.414	93	77	84	82	S E	S W b S	Calm.	S 27 W	1.0	9.4	0.0	3.83	4.44	.050	...
12	.260	.228	.291	.2662	54.0	59.0	47.1	53.98	+ 6.83	.379	.428	.269	.346	91	86	83	82	Calm	W S W	W S W	S 60 W	0.0	7.6	3.0	4.62	4.93	.105	...
13	.279	.284	.498	.3782	44.6	56.2	47.2	49.17	+ 2.27	.253	.328	.268	.268	86	72	82	77	S W b S	W S W	W N W	W	4.2	9.8	5.8	7.16	7.78	.010	...
14	.593	.543	.565	.5712	39.6	58.7	52.9	50.47	+ 3.87	.219	.306	.327	.293	90	62	82	80	W b N	S W b S	W S W	S 37 W	2.6	6.0	0.8	3.73	3.98	.040	...
15	.589	.690	.727	.6818	51.8	63.4	57.6	57.67	+11.32	.363	.404	.342	.368	94	69	72	77	Calm.	W	S b E	S 36 W	0.0	9.4	5.0	4.55	4.96	...	...
16	—	.672	—	—	—	65.6	—	—	—	—	.453	—	—	—	71	—	—	S W b S	S S W	S W b W	S 41 W	10.7	6.0	8.3	8.83	9.10	...	...
17	.699	.686	.446	.5915	57.3	61.6	58.7	59.00	+13.22	.414	.481	.419	.436	88	87	85	87	W	W	S W b W	S 78 W	2.5	4.2	5.8	7.44	8.53	.225	...
18	.408	.709	.786	.6487	44.6	47.5	36.3	42.22	— 3.32	.235	.170	.176	.191	80	50	82	71	N W	N W	N N W	N 38 W	35.3	19.0	3.8	12.74	12.87	...	...
19	.708	.485	.314	.4785	33.4	48.9	43.9	42.76	— 2.57	.163	.226	.218	.208	85	65	75	75	N N W	S b E	W b S	N 44 E	1.8	4.8	2.6	1.58	5.78	.250	...
20	.046	.046	.206	.1053	41.4	47.2	39.9	43.60	— 1.45	.232	.273	.206	.237	89	84	84	83	N	S W b S	W b N	N 72 W	12.8	2.6	5.0	5.17	6.41	.005	...
21	.287	.389	.423	.3592	37.4	52.9	39.2	44.00	— 0.80	.204	.306	.216	.238	91	76	90	82	S W b W	S S W	W b S	S 43 W	0.8	5.0	1.5	4.51	4.82	.105	...
22	.583	.746	.965	.8150	35.6	51.5	39.9	42.10	— 2.47	.193	.212	.206	.208	93	54	84	79	S W	W b N	W N W	N 84 W	1.2	24.4	2.5	6.95	8.92	...	...
23	—	30.048	—	—	—	50.4	—	—	—	—	.268	—	—	—	72	—	—	E N E	E b S	N E b E	N 85 E	7.3	10.5	2.8	6.71	7.07	...	...
24	.902	29.791	.739	.8032	41.0	60.5	50.0	51.47	+ 7.42	.227	.349	.294	.297	89	65	81	78	E N E	S W	Calm.	S 42 W	1.6	10.4	0.0	6.34	6.82	...	...
25	.626	.651	.802	.6940	53.6	48.2	42.5	47.40	+ 3.60	.340	.287	.207	.280	82	85	76	84	S W b W	N W b N	N	N 30 W	8.8	14.0	16.8	6.96	8.95	.110	...
26	.964	30.028	.980	.9892	34.5	40.7	40.3	38.78	— 4.80	.173	.161	.176	.167	86	63	69	70	N	E S E	S E	N 73 E	6.0	11.6	13.0	8.83	9.76	...	...
27	.730	29.363	.528	.5333	41.7	52.2	52.2	48.95	+ 5.60	.200	.369	.222	.286	76	94	56	81	E S E	Calm.	W N W	N 81 W	3.8	0.0	21.6	8.05	10.75	inap.	...
28	.692	.700	.712	.7043	41.0	49.0	42.8	43.90	— 0.80	.192	.205	.213	.211	75	59	77	74	W b N	N W b W	N W	N 65 W	5.3	7.2	2.8	5.70	6.10	inap.	...
29	.722	.856	.904	.8412	40.7	48.2	35.6	41.02	— 1.85	.196	.161	.149	.166	77	47	72	65	W N W	N W b N	N	N 25 W	4.5	12.6	4.0	6.21	6.69	...	...
30	—	.550	—	—	—	43.9	—	—	—	—	.154	—	—	—	53	—	—	S E	E S E	E	S 40 E	3.2	11.4	11.7	6.09	15.58	.930	...
31	.193	.337	.524	.3695	39.2	45.4	41.0	41.07	— 1.35	.173	.215	.210	.203	72	70	81	78	W b S	W N W	S W b W	W	21.2	21.0	7.2	14.16	14.73	.040	...
	29.5924	29.5962	29.6368	29.6123	46.01	55.23	48.37	49.96	+ 3.67	.278	.320	.283	.295	86	70	80	79	.....	.....	.....	.....	6.51	8.49	5.21	.....	7.11	2.690	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR OCTOBER, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.162 at 8 a.m. on 23rd. } Monthly range=
Lowest Barometer .....29.046 from 6 a.m. and 2 p.m. on 20th. } 1.116 inches.

Self-registering Ther.
- Maximum temperature .....68°5 on 1st. } Monthly range=
- Minimum temperature.....30°2 on 19th. } 38°3
- Mean maximum temperature .....58°44 } Mean daily range=
- Mean minimum temperature .....43°18 } 15°26
- Greatest daily range .....29°4 from a.m. to p.m. of 27th.
- Least daily range ..... 7°1 from a.m. to p.m. of 3rd.

Warmest day..... 1st; mean temperature.....60°45 } Difference=21°67.
Coldest day.....26th; mean temperature.....38°78 }

Maximum Radiation { Solar..... 82°0 on 1st. } Monthly range= 62°0.
{ Terrestrial..... 20°0 on 19th. }

Aurora observed on 5 nights, viz.:—3rd, 20th, 24th, 25th and 27th.

Possible to see Aurora on 20 nights; impossible on 11 nights.

Raining on 16 days; depth, 2.690 inches; duration of fall, 65.7 hours.

Mean of cloudiness=0.62.

WIND.

Resultant direction, N. 85° W.; resultant velocity, 1.86.

Mean velocity, 7.11 miles per hour.

Maximum velocity, 35.3 miles, from 5.30 to 6.30 a.m. of 18th.

Most windy day, 30th; mean velocity, 15.58 miles per hour.

Least windy day, 10th; mean velocity, 1.74 miles per hour.

Most windy hour, 11 a.m.; mean velocity, 10.07 miles per hour.

Least windy hour, 10 p.m.; mean velocity, 4.77 miles per hour.

Fog recorded, 1st, 11th and 17th. Dew on 2nd and 8th.

Lightning on 3rd. Lightning with Thunder, 17th and 21st.

Lunar haloes on 1st, 10th and 29th. Lunar corona on 7th.

19th, first recorded ice of season.

20th, 10.57 a.m. shock of an earthquake felt in Toronto and generally in Canada.

Rainbows on 18th and 28th.

24th and 25th. During the auroral display on both evenings, a brilliant red band extended from W. to S.E., vertex about 30° S. of zenith, about 8° in width, but ill defined.

COMPARATIVE TABLE FOR OCTOBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	V'locity	Mean Velocity.
	°	°	°	°	°					°		
1842	45.1	— 0.5	68.6	27.5	41.1	8	5.175	0	...	...	...	0.35 lbs.
1843	41.8	— 3.8	68.0	24.2	43.8	12	3.790	4	2.5	...	...	0.54
1844	43.3	— 2.3	71.6	15.9	55.7	7	impr.	4	12.0	...	...	0.43
1845	46.4	+ 0.8	64.0	19.7	44.3	11	1.760	1	inap.	...	...	0.26
1846	44.6	— 1.0	70.1	20.7	49.4	14	4.180	2	inap.	...	...	0.44
1847	44.0	— 1.6	64.6	20.4	44.2	13	4.390	2	inap.	...	...	0.19
1848	46.3	+ 0.7	61.8	24.5	37.3	11	1.550	0	...	N 54 W	1.24	4.60 mls.
1849	45.3	— 0.3	58.9	24.2	34.7	13	5.965	1	inap.	N 12 W	1.27	7.76
1850	45.4	— 0.2	66.7	22.4	44.3	10	2.085	0	...	N 66 W	1.10	5.30
1851	47.4	+ 1.8	66.2	25.2	41.0	10	1.680	2	0.3	S 72 W	1.06	4.39
1852	48.0	+ 2.4	70.7	23.8	46.9	12	5.280	0	...	N 5 E	1.19	4.47
1853	44.4	— 1.2	64.7	23.4	41.3	10	0.875	2	inap.	S 88 W	1.74	4.77
1854	49.5	+ 3.9	75.4	26.4	49.0	15	1.495	3	inap.	N 45 W	1.52	4.57
1855	45.4	— 0.2	68.0	22.6	45.4	14	2.485	5	0.8	N 82 W	4.91	9.88
1856	45.3	— 0.3	71.4	23.0	48.4	10	0.875	2	0.1	N 76 W	2.15	6.07
1857	45.4	— 0.2	64.0	26.5	37.5	10	1.040	2	0.2	N 19 W	2.93	6.24
1858	48.8	+ 3.2	76.3	31.5	44.8	17	1.797	1	inap.	N 34 W	0.36	5.96
1859	43.0	— 2.6	69.8	22.3	47.5	11	0.940	4	inap.	N 68 W	5.04	8.12
1860	47.3	+ 1.7	68.0	28.4	39.6	15	1.618	1	inap.	N 9 W	2.00	6.93
1861	48.7	+ 3.1	71.0	29.0	42.0	15	1.993	1	inap.	N 61 W	1.06	5.96
1862	48.7	+ 3.1	76.6	26.2	50.4	19	2.684	2	0.5	N 78 W	2.89	6.53
1863	45.9	+ 0.3	66.4	30.5	35.9	16	2.522	0	...	S 71 W	0.48	6.16
1864	45.2	— 0.4	67.0	28.0	39.0	22	3.321	1	inap.	N 60 W	3.17	6.66
1865	44.5	— 1.1	71.4	21.6	49.8	17	2.705	3	4.5	N 36 W	3.55	7.26
1866	49.1	+ 3.5	71.0	31.8	39.2	11	2.470	1	inap.	N 30 W	0.84	5.53
1867	49.9	+ 4.3	75.4	31.0	44.4	11	1.970	0	...	N 45 W	1.51	5.73
1868	42.4	— 3.2	67.6	24.0	43.6	10	1.365	2	2.0	N 89 W	1.27	7.10
1869	42.3	— 3.3	69.8	18.7	51.1	8	0.962	7	2.3	N 73 W	3.72	6.73
1870	50.0	+ 4.4	68.5	30.2	38.3	16	2.690	0	...	N 85 W	1.86	7.11
Results to 1869.	45.65	.....	68.75	24.76	43.99	12.37	2.420	1.93	0.93	N 59 W	1.81	6.08
Exc. for 1870.	+ 4.31	.....	— 0.25	+ 5.44	— 5.69	+ 3.63	+ 0.270	— 1.93	— 0.93	...	...	+ 1.03

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—NOVEMBER, 1870.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Re-sult'.	M'N.		
					°	°	°	°	°												°							
1	29.603	29.461	29.451	29.5013	38.1	49.7	43.5	42.87	+ 0.70	.195	.255	.214	.213	85	71	75	77	S W	S S W	S W	S 28 W	8.2	12.8	3.0	5.76	6.04	...	...
2	.416	.283	.140	.2657	37.0	55.5	50.8	49.62	+ 7.70	.168	.273	.283	.254	76	62	76	71	S E	S B W	S W B S	S 39 W	1.8	13.2	7.4	6.59	7.98	...	...
3	.245	.499	.665	.4923	46.8	48.8	33.4	42.12	+ 0.43	.216	.156	.171	.176	67	45	89	67	W B N	N W B W	W N W	N 67 W	14.0	29.3	1.6	12.43	12.63	...	...
4	.710	.565	.545	.6067	30.9	49.0	41.7	41.15	— 0.27	.157	.235	.228	.209	90	67	86	80	Calm.	S W B S	S W	S 51 W	0.0	14.0	0.8	3.19	4.14	...	...
5	.661	.857	.997	.8602	43.5	47.2	35.6	40.77	— 0.38	.205	.164	.167	.170	72	50	80	68	N W B N	N N W	N B W	N 9 W	9.8	15.5	12.6	9.75	11.15	...	...
6	—	.953	—	—	—	42.1	—	—		—	.170	—	—	—	62	—	—	N E B E	E B N	E B N	N 67 E	8.3	9.0	1.4	4.66	6.37	...	...
7	.930	.928	.843	.8900	33.4	42.5	38.5	37.70	— 2.88	.163	.164	.182	.169	85	59	78	75	N W	S S E	E B S	S 74 E	5.4	6.2	7.5	2.84	5.79	...	...
8	.606	.306	.236	.3610	39.9	52.6	52.6	48.37	+ 8.05	.198	.321	.342	.291	79	80	86	84	E N E	S S E	S W B S	S 15 W	6.0	9.6	14.2	7.20	8.97	.424	...
9	.076	.305	.579	.3643	50.8	47.5	37.8	44.37	+ 4.37	.356	.216	.183	.244	96	65	80	80	S W B S	W B S	W B N	N 88 W	13.4	21.0	19.4	16.13	17.08	.090	0.1
10	.933	30.007	.973	.9772	30.2	40.3	30.9	33.87	— 5.80	.149	.133	.120	.137	89	52	69	71	N W B W	N W B W	W N W	N 65 W	1.0	11.8	2.4	5.15	5.25	...	...
11	.932	29.764	.649	.7722	29.1	39.2	34.9	34.10	— 5.20	.141	.180	.176	.160	87	75	86	81	W N W	S E B S	S E	S 30 E	5.0	5.5	2.8	2.43	3.57	...	...
12	.572	.515	.471	.5228	30.6	47.5	36.3	38.60	— 0.37	.152	.225	.193	.193	89	69	90	82	E S E	W N W	W N W	N 88 W	2.8	10.0	1.0	2.58	3.78	...	...
13	—	.530	—	—	—	46.8	—	—		—	.188	—	—	—	59	—	—	W N W	W	N W B W	N 74 W	3.3	7.8	8.5	7.83	8.13	.060	...
14	.366	.304	.404	.3603	36.7	36.7	31.6	34.95	— 3.28	.205	.188	.147	.179	94	86	83	88	Calm.	N N E	N W B W	N 36 W	0.0	7.5	4.8	4.70	5.69	.020	...
15	.406	.366	.410	.3990	28.8	37.8	28.8	31.97	— 5.87	.144	.131	.129	.136	90	58	81	76	N W B W	W	N W B W	N 81 W	3.5	14.0	2.0	5.51	5.79	...	Inap.
16	.424	.474	.623	.5218	33.1	39.2	32.4	34.55	— 2.90	.138	.131	.146	.138	73	54	79	69	W S W	W S W	W S W	S 61 W	5.6	15.5	8.0	9.09	9.17	...	...
17	.675	.563	.556	.5967	36.3	41.4	39.2	38.90	+ 1.88	.193	.178	.216	.195	90	67	90	82	S W B S	S W B S	S W B S	S 52 W	10.5	22.4	8.5	10.43	14.25	Inap	...
18	.602	.657	.680	.6570	32.0	32.4	24.4	28.22	— 8.38	.158	.116	.117	.125	87	62	89	80	N N W	N N W	N W B W	N 41 W	17.6	15.0	10.0	14.77	15.17	...	Inap.
19	.638	.699	.640	.6303	22.3	32.0	30.9	27.62	— 8.55	.100	.121	.134	.118	83	66	77	78	N W B W	N W	S W B W	N 68 W	12.8	22.0	3.8	8.55	10.58	...	...
20	—	.447	—	—	—	42.5	—	—		—	.227	—	—	—	83	—	—	S S W	S S W	S W B W	S 44 W	16.8	12.0	11.3	11.33	11.88	...	...
21	.614	.776	.856	.7867	35.6	34.0	24.1	30.43	— 4.85	.177	.142	.107	.140	85	73	82	81	W	W N W	N N W	N 47 W	10.5	24.0	0.8	9.05	9.95	...	...
22	.948	.713	.390	.6580	20.8	31.6	28.4	27.43	— 7.38	.097	.148	.142	.131	87	83	90	86	N E B N	E B N	N E B N	N 54 E	7.8	17.2	15.8	13.58	14.30	...	3.0
23	.183	.322	.552	.3673	27.3	30.6	27.7	28.40	— 5.97	.133	.152	.121	.134	89	89	80	85	N W B W	W B N	W B S	N 72 W	13.6	11.8	10.0	10.39	11.92	...	Inap.
24	.516	.606	.702	.6197	32.7	38.5	30.2	34.47	+ 0.27	.165	.173	.149	.163	88	74	89	83	S W B W	W B S	W B S	S 63 W	9.0	13.5	2.0	6.99	7.06	...	...
25	.660	.514	.329	.4810	28.4	38.5	33.4	33.25	— 0.15	.134	.182	.163	.156	86	78	85	82	S W B W	S W B W	S W	S 46 W	4.5	12.0	6.5	8.86	8 98	...	...
26	.272	.232	.216	.2450	32.7	38.5	39.6	36.82	+ 3.88	.156	.173	.202	.182	85	74	83	83	S W	S W B W	S W B S	S 51 W	11.5	11.6	13.4	10.65	10.74	...	...
27	—	.452	—	—	—	49.3	—	—		—	.212	—	—	—	59	—	—	S W	S W	W S W	S 63 W	8.0	7.4	2.8	4.86	4.95	...	...
28	.710	.638	.633	.6612	33.8	41.7	42.1	39.45	+ 7.48	.158	.237	.232	.213	81	89	86	86	W S W	E	N E	N 46 E	3.6	9.0	2.8	4.25	4.93	Inap.	...
29	.696	.830	.964	.8403	38.8	40.7	33.4	37.08	+ 5.53	.195	.169	.134	.164	82	66	70	73	N B E	N B W	N B W	N 8 W	6.8	13.2	5.0	6.97	7.13	...	...
30	30.071	.972	.867	.9570	27.3	37.8	35.6	33.63	+ 2.60	.118	.165	.167	.154	79	72	80	79	N B W	S S W	S W B W	S 50 W	2.2	11.0	13.2	7.81	8.81	...	...
	29.5948	29.5798	29.5912	29.5921	33.73	41.20	35.30	36.55	— 0.69	.168	.182	.176	.175	84	69	82	79	.....	.....	.....	.....	7.44	13.49	6.78	.....	8.74	0.594	3.1

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR NOVEMBER, 1870.

NOTE—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....30.071 at 6 a.m. on 30th } Monthly range=
Lowest Barometer .....29.076 at 6 a.m. on 9th } 0.995 inches.

Self-registering Ther.
- Maximum Temperature ..... 57°2 on 2nd } Monthly range=
- Minimum Temperature ..... 19°4 on 22nd } 37°8
- Mean Maximum Temperature ..... 44°14 } Mean daily range=
- Mean Minimum Temperature ..... 30°18 } 13°96
- Greatest daily range.....22°7 from a.m. to p.m. of 2nd.
- Least daily range ..... 4°8 from a.m. to p.m. of 14th.

Warmest Day..... 2nd ... Mean Temperature.....49°62 } Difference=22°19
Coldest Day.....22nd ... Mean Temperature.....27°43 }

Maximum Radiation.
- Solar .....84°0 on 2nd } Monthly range=
- Terrestrial.....10°0 on 24th } 74°0

Aurora observed on 8 occasions, viz., 12th, 15th, 16th, 18th, 19th a.m., and p m. 21st, 24th.

Possible to see Aurora on 19 nights; impossible on 11 nights.

Snowing on 5 days; depth 3.1 inches; duration of fall 16.5 hours.

Raining on 6 days; depth 0.594 inches; duration of fall 22.8 hours.

Mean of Cloudiness=0.60.

WIND.

Resultant Direction N. 89° W.; Resultant Velocity 4.36.

Mean Velocity 8.74 miles per hour.

Maximum Velocity 30.0 miles, at 10 a.m., noon, and 1 p.m. of 3rd.

Most Windy day 9th; Mean Velocity 17.08 miles per hour.

Least Windy day 11th; Mean Velocity 3.57 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 13.82 miles per hour.

Least Windy hour 11 p.m.; Mean Velocity 5.98 miles per hour.

Fog recorded on 4th, 6th, 7th, 12th and 13th. Solar haloes on 7th, 11th and 16th.
Lunar haloes on 2nd, 7th, 10th and 30th.
Thunder on November 8th. Lightning 2nd.
1st and 2nd very much like Indian Summer.
10th. 3 to 5 a.m. First snow of season.
7th. Grasshoppers still numerous and active.

COMPARATIVE TABLE FOR NOVEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°					°		
1842	33.3	— 3.4	56.8	8.1	48.7	9	5.310	10	...	...	...	1.22 lbs
1843	33.5	— 3.2	52.6	14.1	38.5	10	4.765	7	1.2	...	...	0.59
1844	34.9	— 1.8	56.0	12.1	43.9	8	Imp.	4	8.0	...	...	0.48
1845	36.8	+ 0.1	59.5	8.1	51.4	7	1.105	4	5.0	...	...	0.53
1846	41.3	+ 4.6	55.6	18.0	37.6	12	5.805	2	0.4	...	...	0.64
1847	38.6	+ 1.9	57.9	8.7	49.2	14	3.155	3	Inap.	...	...	0.36
1848	34.5	— 2.2	49.0	15.9	33.1	9	2.020	3	1.4	N 81 W	1.81	4.81mls
1849	42.6	+ 5.9	56.4	26.5	29.9	10	2.815	2	1.0	N 39 W	1.55	4.78
1850	38.8	+ 2.1	62.8	11.0	51.8	7	2.955	1	Inap.	N 42 W	1.43	5.27
1851	32.9	— 3.8	50.2	13.8	36.4	5	3.885	6	6.7	N 50 W	1.25	4.70
1852	36.0	— 0.7	50.4	18.2	32.2	7	1.775	3	2.0	N 59 W	1.53	6.50
1853	38.7	+ 2.0	55.6	12.8	42.8	15	2.425	6	2.7	N 9 W	0.55	5.52
1854	36.8	+ 0.1	55.4	13.8	41.6	13	1.115	4	1.3	W	3.44	7.54
1855	38.6	+ 1.9	59.2	15.5	45.7	8	4.590	6	3.0	N 66 W	3.18	10.81
1856	37.4	+ 0.7	56.4	18.8	37.6	10	1.375	9	9.5	S 85 W	2.95	8.75
1857	33.5	— 3.2	58.2	—3.5	61.7	14	3.235	9	6.9	S 61 W	5.45	9.25
1858	34.2	— 2.5	53.0	15.3	37.7	12	3.879	13	4.0	N 25 W	3.14	8.87
1859	38.9	+ 2.2	62.6	21.8	40.8	12	5.193	9	0.6	N 81 W	3.39	9.65
1860	37.9	+ 1.2	64.5	13.2	51.3	12	2.569	8	1.9	S 89 W	4.95	11.02
1861	37.1	+ 0.4	52.4	23.0	29.4	14	4.294	8	3.2	N 46 W	1.94	7.44
1862	35.6	— 1.1	58.0	16.2	41.8	11	2.205	11	5.3	N 46 W	3.00	6.60
1863	39.1	+ 2.4	67.0	17.8	49.2	13	3.656	6	0.1	N 88 W	3.50	7.86
1864	36.9	+ 0.2	60.2	21.0	39.2	11	3.765	8	4.5	S 72 W	3.82	7.64
1865	38.6	+ 1.9	63.2	23.6	39.6	5	0.975	7	1.1	N 79 W	2.98	7.90
1866	38.4	+ 1.7	54.2	21.8	32.4	13	2.965	4	2.2	N 88 W	3.06	6.96
1867	36.9	+ 0.2	60.4	9.6	50.8	8	1.835	9	0.9	N 87 W	4.02	7.76
1868	36.2	— 0.5	50.5	20.1	30.4	14	5.150	10	4.3	N 35 W	2.10	8.16
1869	32.7	— 4.0	58.0	13.0	45.0	9	2.540	18	10.2	N 78 W	3.69	8.12
1870	36.6	— 0.1	57.2	19.4	37.8	6	0.594	5	3.1	N 89 W	4.36	8.74
Results to 1869.	36.72	...	57.00	15.30	41.70	10.17	3.070	6.77	3.24	N 78 W	2.57	7.54
Excess for '70	— 0.17	...	+ 0.20	+ 4.10	— 3.90	— 4.17	— 2.476	— 1.77	— 0.14	...	...	+ 1.20

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—DECEMBER, 1870.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6. A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	ME'N		6· A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	MEN.		
					°	°	°	°	°																			
1	29.688	29.495	29.400	29.5138	35.3	41.7	37.4	37.83	+ 7.30	.146	.157	.170	.157	71	58	75	69	W S W	S W	S W B W	S 58 W	7.4	12.0	2.2	7.05	7.17	...	...
2	.346	.304	.462	.3807	32.0	43.2	38.8	37.82	+ 7.77	.157	.190	.170	.167	87	68	71	74	W	W B S	W B N	N 84 W	3.2	19.4	8.2	10.69	11.12	...	...
3	.560	.532	.480	.5255	32.7	42.8	39.6	37.95	+ 8.40	.157	.160	.184	.177	84	57	75	78	W N W	S W B S	S W B W	S 59 W	2.8	9.6	6.0	6.11	6.77	...	...
4	—	.300	—	—	—	44.3	—	—	—	—	.176	—	—	—	60	—	—	S B E	W	W	N 82 W	3.0	7.0	3.2	1.47	5.27	...	...
5	.462	.169	28.807	.1537	37.0	37.4	43.5	38.90	+10.27	.209	.204	.259	.219	95	91	92	92	E B N	E B N	S S W	S 89 E	10.2	21.2	18.0	8.11	15.46	1.950	...
6	.031	.422	29.622	.3853	37.4	37.1	29.5	34.90	+ 6.73	.204	.174	.136	.174	91	78	83	85	N W	N W B W	W B N	N 58 W	16.0	26.8	23.0	11.84	12.04	...	...
7	.547	.238	.131	.2968	32.0	38.5	37.8	36.28	+ 8.57	.158	.199	.208	.187	87	85	91	87	W B N	E	S W B S	S 65 E	3.0	19.0	6.8	2.67	11.53	.180	...
8	.274	.495	.674	.5043	34.5	32.7	30.6	32.00	+ 4.72	.163	.156	.152	.154	82	85	89	85	N W B N	N W B N	N W	N 35 W	18.5	26.2	13.4	16.68	16.81	...	inap.
9	.767	.895	.974	.8908	27.3	28.4	28.0	27.90	+ 1.03	.133	.119	.139	.129	89	76	90	84	N N W	N	N B E	N 7 W	7.2	7.8	3.4	5.85	6.04	...	...
10	30.004	.985	.997	30.0038	28.0	29.1	24.0	26.68	+ 0.23	.131	.137	.115	.126	86	85	89	87	N W B N	N W	N B W	N 19 W	9.8	10.6	4.6	6.64	7.42	...	...
11	—	.969	—	—	—	24.4	—	—	—	—	.110	—	—	—	84	—	—	N E B E	N E	E N E	N 68 E	10.5	13.0	16.0	14.24	14.48	...	6.0
12	29.640	.555	.560	29.5802	33.4	37.4	37.8	36.33	+10.68	.171	.213	.227	.206	89	95	99	95	E B N	S E B E	S S E	S 49 E	19.1	12.8	4.8	7.86	9.62	.260	0.1
13	.521	.500	.424	.4760	36.7	37.8	33.4	35.55	+10.28	.205	.173	.178	.184	94	77	93	89	S W	S W S	S W B S	S 59 W	6.1	9.4	9.2	7.64	7.83	.040	0.2
14	.387	.365	.534	.4453	32.0	33.8	29.1	31.47	+ 6.58	.166	.158	.141	.151	91	81	87	85	W B S	W B S	W N W	N 76 W	8.0	9.5	23.0	18.14	19.08	...	...
15	.710	.760	.857	.7840	23.0	23.3	18.6	21.23	— 3.32	.106	.103	.090	.095	86	82	89	84	N W B W	N B W	N B W	N 45 W	17.2	9.4	9.4	12.38	13.10	...	0.2
16	.887	.853	.819	.8483	15.4	24.4	25.2	22.15	— 2.08	.077	.089	.107	.093	87	68	79	78	N W	N W	W B S	N 67 W	3.5	21.0	7.2	8.86	10.62	...	inap.
17	.655	.440	.406	.4862	26.0	32.4	30.6	29.70	+ 5.80	.119	.135	.152	.134	85	74	89	82	S W B W	S W B W	W B N	S 71 W	11.6	13.2	11.2	11.06	12.15	...	0.3
18	—	.559	—	—	—	27.0	—	—	—	—	.093	—	—	—	63	—	—	W N W	N	S E B E	N 18 E	10.4	0.8	3.5	2.22	4.17	...	inap.
19	.601	.448	28.970	.3147	28.7	33.8	31.6	31.52	+ 8.18	.138	.144	.163	.151	87	75	91	85	Calm.	S S E	E B S	S 36 E	0.0	12.5	20.5	6.04	11.60	inap.	2.0
20	28.978	.150	29.178	.1217	32.0	34.9	32.0	32.53	+ 9.47	.173	.151	.143	.151	96	75	79	82	W S W	W S W	S W B W	S 65 W	13.0	14.0	12.0	13.02	13.10	...	0.1
21	29.393	.596	.729	.5932	21.9	18.3	12.2	16.57	— 6.28	.097	.062	.059	.069	82	61	78	73	W S W	W B S	W S W	S 67 W	17.4	21.5	17.0	17.45	17.56	...	...
22	.782	.772	.772	.7772	8.2	16·5	10.4	11.52	—11.10	.052	.064	.055	.057	82	68	78	77	W S W	W S W	W S W	S 78 W	15.5	15.0	9.4	10.69	11.07	...	...
23	.681	.639	.663	.6580	8.2	14.3	11.4	10.95	—11.47	.046	.065	.051	.056	73	78	69	77	W B S	W B S	W B S	S 88 W	5.0	16.0	11.8	10.21	10.77	...	...
24	.738	.771	.908	.8287	6.4	12.8	8.2	8.58	—13.63	.056	.064	.052	.055	95	82	82	85	N W B W	N N W	N W B N	N 45 W	8.5	5.0	3.6	6.64	6.28	...	0.2
25	—	.981	—	—	—	16.1	—	—	—	—	.074	—	—	—	83	—	—	W	S W B W	S W B S	S 49 W	10.7	16.0	19.3	13.66	14.71	...	2.0
26	.602	.675	...	...	20.1	23.0	...	...	...	.091	.106	...	...	85	86	...	...	S W B W	S W B W	S W B W	S 62 W	9.0	18.6	16.6	16.53	16.61	...	...
27	.778	.505	.461	.5607	10.4	27.3	27.0	21.78	+ 0.05	.055	.118	.107	.094	78	79	73	77	S W B W	S W	W S W	S 60 W	15.2	20.0	20.2	14.20	15.73	...	0.2
28	.443	.543	.671	.5633	22.3	13.6	1.3	11.07	—10.55	.107	.067	.040	.066	89	83	85	84	N W B N	N N W	N	N 16 W	12.5	12.0	13.4	13.37	13.60	...	0.1
29	.678	.656	.642	.6655	—5.5	4.2	1.0	0.68	—20.83	.029	.036	.041	.037	86	68	88	81	N N W	N W	W N W	N 65 W	12.5	13.2	1.4	5.27	8.08	...	...
30	.418	.008	28.933	.1005	20.5	27.3	33.4	27.92	+ 6.47	.086	.147	.163	.135	79	99	85	86	S W B S	S B W	S W B S	S 16 W	15.0	20.5	11.0	13.92	15.72	inap.	4.0
31	.103	.354	29.619	.3857	30.6	30.2	24.4	28.12	+ 6.72	.152	.136	.110	.131	89	80	84	84	S W B W	N W B W	W S W	N 73 W	8.0	16.0	5.6	8.61	9.65	...	0.5
	29.5412	29.5173	29.5265	29.5325	24.86	28.97	26.03	26.46	+ 1.60	.127	.132	.131	.129	86	77	84	82	.....	.....	.....	.....	10.00	14.48	10.80	.....	11.46	2.430	15.9

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR DECEMBER, 1870.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....30.066 at 8 a.m. on 25th.
Lowest Barometer.....28.807at 10 p.m. on 5th. } Monthly range= 1.259

Self-registering Ther.
- Maximum temperature .....45°2 on 5th.
- Minimum temperature .....—5.8 on 29th. } Monthly range= 51°0
- Mean maximum temperature.....31°97
- Mean minimum temperature.....20°48 } Mean daily range= 11°49
- Greatest daily range.....36°0 from p.m. of 29th. to p.m. of 30th.
- Least daily range.....3°5 from a.m. to p.m. of 8th and 9th.

Warmest day..... 5th; mean temperature 38°90
Coldest day ..... 29th; mean temperature 0°68 } Difference=38°22

Maximum Solar... ..... 58°0 on 3rd.
Radiation Terrestrial ..... —11°5 on 29th. } Monthly range= 69°5

Aurora observed on 4 occasions, viz.: 10th, 16th a.m. 21st and 24th.

Possible to see aurora on 10 nights; impossible on 21 nights.

Snowing on 16 days; depth 15.9 inches; duration of fall 76.3 hours.

Raining on 6 days; depth, 2.430 inches; duration of fall, 42.1 hours.

Mean of cloudiness=0.78.

WIND.

Resultant direction, N. 89° W.; Resultant velocity, 5.60.

Mean velocity, 11.46 miles per hour.

Maximum velocity, 27.4 miles, from 11.30 p.m. of 14th. to 0.30 a.m. of 15th.

Most windy day, 14th; mean velocity, 19.08 miles per hour.

Least windy day, 18th; mean velocity, 4.17 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 15.05 miles per hour.

Least windy hour, midnight; mean velocity, 8.74 miles per hour.

Solar haloes recorded on 1st, 16th, 23rd & 24th. Lunar halo on 6th.

Lunar corona on 6th, 15th & 31st. Fog on 7th & 19th.

Butterflies about on 3rd.

22nd. Bay frozen over.

COMPARATIVE TABLE FOR DECEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	V'locity.	Mean Velocity.
	°	°	°	°	°					°		
1842	24.7	— 1.3	40.5	3.2	37.3	3	0.880	17	...	...	...	0.61 lbs
1843	30.0	+ 4.0	48.5	3.1	45.4	6	1.040	8	8.1	...	...	0.53
1844	28.2	+ 2.2	48.5	1.6	46.9	6	impr.	6	4.2	...	...	0.40
1845	21.1	— 4.9	39.7	— 2.4	42.1	2	inap.	12	4.7	...	...	0.70
1846	27.5	+ 1.5	49.2	3.9	45.3	5	1.215	9	6.0	...	...	0.57
1847	30.1	+ 4.1	49.6	0.3	49.3	7	1.185	8	6.8	...	...	0.35
1848	29.1	+ 3.1	48.8	1.1	47.7	7	2.750	7	16.5	S 83 W	1.12	5.44 m.
1849	26.5	+ 0.5	40.8	— 6.5	47.3	5	0.840	12	9 6	N 82 W	2.56	6.23
1850	21.7	— 4.3	48.8	— 9.0	57.8	2	0.190	18	29.5	N 44 W	2.93	7.40
1851	21.5	— 4.5	44.0	—14.8	58.8	6	1.075	15	10.7	N 82 W	4.00	7.37
1852	31.9	+ 5.9	51.0	13.2	37.8	7	3.995	10	20.1	S 69 W	1.03	6.54
1853	25.3	— 0.7	46.4	— 8.4	54.8	4	0.625	13	22.3	N 35 W	2.39	4.98
1854	21.9	— 4.1	44.8	— 7.0	51.8	5	0.590	12	17.2	N 44 W	4.30	8.56
1855	26.8	+ 0.8	47.0	— 5.2	52.2	6	1.845	10	29.5	S 88 W	5.29	11.38
1856	22.9	— 3.1	42.2	— 9.1	51.3	6	1.790	20	16.3	S 87 W	4.62	11.56
1857	31.9	+ 5.9	46.0	4.7	41.3	7	3.205	14	9.0	N 89 W	2.50	6.84
1858	27.4	+ 1.4	45.4	4.2	41.2	11	1.657	18	10.4	N 78 W	1.66	9.36
1859	17.9	— 8.1	54.8	— 6.0	60.8	3	1.035	23	37.4	N 53 W	4.29	10.77
1860	24.0	— 2.0	39.0	— 7.0	46.0	3	1.362	21	13.5	N 62 W	4.66	10.14
1861	31.1	+ 5.1	55.2	5.5	49.7	6	0.560	8	6.8	N 72 W	3.50	7.96
1862	28.8	+ 2.8	50.1	— 3.4	53.5	5	1.945	8	10.4	N 73 W	3.17	7.58
1863	27.0	+ 1.0	53.4	— 1.5	54.9	10	2.960	17	7.1	N 41 W	1.61	9.40
1864	24.7	— 1.3	50.4	—10.4	60.8	9	2.045	18	27.1	S 82 W	4.94	9.98
1865	27.7	+ 1.7	54.2	5.7	48.5	7	1.727	11	5.2	S 81 W	3.07	7.33
1866	25.1	— 0.9	51.0	— 5.0	56.0	7	2.790	13	15.5	S 88 W	4.98	9.91
1867	21.6	— 4.4	49.5	—12.8	62.3	7	1.408	21	13.6	S 81 W	4.82	10.32
1868	22.5	— 3.5	44.2	— 3.2	47.4	1	0.005	18	15.5	N 71 W	4.05	9.80
1869	28.7	+ 2.7	45.0	6.0	39.0	10	2.590	9	7.1	S 80 W	2.31	8.44
1870	26.5	+ 0.5	45.2	— 5.8	51.0	6	2.430	16	15.9	N 89 W	5.06	11.46
Results to 1869.	26.02	.....	47.43	—2.11	49.54	5.77	1.652	13.30	14.08	N 76 W	3.09	8.51
Excess for 1870.	+ 0.44	.....	+ 2.23	— 3.69	+ 1.46	+ 0.23	+ 0.778	+ 2.70	+ 1.82	...	...	+ 2.95

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1870.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY

Latitude 43° 39′ 4″ North. Longitude 5h. 17m. 33s. West. Elevation above

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.
Mean temperature	24°·45	21°·54	26°·27	44°·58	56°·30	67°·29	68°·79
Difference from average (30 years)	+ 1·35	— 1·48	— 3·35	+ 3·62	+ 4·91	+ 5·86	+ 1·51
Thermic anomaly (lat. 45° 40′)	— 8·35	—13·16	—13·83	— 5·62	— 1·80	+ 2·69	+ 0·09
Highest temperature	45·0	40·6	44·0	67·0	81·2	88·4	87·4
Lowest temperature	— 3·2	— 6·6	5·2	29·6	38·8	50·0	48·0
Monthly and annual ranges	48·2	47·2	38·8	37·4	42·4	38·4	39·4
Mean maximum temperature	32·15	28·02	32·97	53·51	66·48	76·39	77·67
Mean minimum temperature	17·58	14·74	20·46	36·50	47·37	57·38	59·98
Mean daily range	14·57	13·28	12·51	17·01	19·11	19·01	17·69
Greatest daily range	36·2	33·2	26·4	29·6	30·8	31·8	24·0
Mean height of the Barometer	29·6241	29·5315	29·6440	29·6088	29·5627	29·5734	29·5332
Difference from average (29 years)	—·0183	—·0966	+·0434	+·0147	—·0059	—·0018	—·0647
Highest barometer	30·212	30·175	30·174	29·956	29·918	29·878	29·773
Lowest barometer	28·166	28·900	28·881	29·273	29·116	29·184	29·185
Monthly and annual ranges	2·046	1·275	1·293	0·683	0·802	0·694	0·588
Mean humidity of the air	82	80	78	67	63	72	74
Mean elasticity of aqueous vapour	0·115	0·099	0·116	0·198	0·282	0·485	0·523
Mean of cloudiness	0·77	0·73	0·68	0·56	0·61	0·51	0·58
Difference from average (17 years)	+ 0·05	+ 0·01	+ 0·06	—·0·04	+ 0·05	— 0·02	+ 0·08
Resultant direction of the wind	S. 89 W.	N. 29 W.	N. 18 E.	N. 40 E.	N. 23 E.	N. 17 E.	S. 78 W.
" velocity of the wind	2·63	2·84	4·73	3·55	1·09	0·40	1·59
Mean velocity (miles per hour)	8·98	8·10	10·15	7·03	5·48	5·14	4·82
Difference from average (22 years)	+ 0·79	— 0·50	+ 1·38	— 1·12	— 1·28	— 0·01	— 0·14
Total amount of rain	3·412	0·520	0·755	2·145	1·150	8·090	1·896
Difference from average (29-30 years)	+2·247	—0·417	—0·852	—0·274	—2·206	+5·294	—1·497
Number of days of rain	8	2	2	9	10	16	16
Total amount of snow	21·3	20·1	62·4	0·1	·	...	...
Difference from average (27 years)	+ 5·53	+ 0·96	+52·07	— 2·41	— 0·07	...	...
Number of days of snow	18	18	18	2	·	...	...
Number of fair days	9	10	12	20	21	14	15
Number of auroras observed	4	1	6	11	7	7	4
Possible to see aurora (No. of nights)	10	10	12	18	19	21	20
Number of thunder-storms	...	...	...	1	1	11	9

REGISTER FOR THE YEAR 1870.

TORONTO, ONTARIO.

Lake Ontario, 108 feet. Approximate elevation above the Sea, 342 feet.

Aug.	Sept.	Oct.	Nov.	Dec.	1870.	1869.	1868.	1867.	1866.	1865.	1864.
67°·10	61°·78	49°·96	36°·65	26°·46	45°·93	43°·13	43°·33	43°·84	43°·51	44°·92	44°·70
— 1·09	+ 3·75	+ 4·32	— 0·07	— 0·44	+ 1·83	— 0·97	— 0·77	— 0·26	— 0·59	+ 0·82	+ 0·60
1·40	+ 0·28	— 3·84	— 6·55	— 9·54	— 5·07	— 7·87	— 7·67	— 7·16	— 7·49	— 6·08	— 6·30
84·0	78·0	68·5	57·2	45·2	88·4	89·0	93·4	95·2	94·0	90·5	94·0
40·0	45·8	30·2	20·8	— 5·8	— 6·6	— 5·4	— 15·6	— 12·8	— 14·0	— 10·0	— 15·0
44·0	32·2	38·5	36·4	51·0	95·0	94·4	109·0	108·0	108·0	100·5	109·0
6											
76·82	69·17	58·44	44·14	31·97	...	...	...	...	...	...	...
57·14	54·27	43·18	30·18	20·48	...	...	...	...	...	...	...
19·78	14·90	15·25	13·96	11·49	15·71	14·61	15·26	15·47	14·99	15·43	14·57
30·	24·0	29·4	22·7	36·0	36·2	33·6	38·7	31·6	40·8	36·9	37·4
29·5818	29·7514	29·6123	29·5921	29·5323	29·5956	29·5970	20·6421	29·6140	29·6216	29·6330	29·5596
—·0426	+·0856	—·0337	—·0188	—·1234	—·0219	—·0205	+·0246	—·0035	+·0041	+·0155	—·0579
29·977	30·001	30·162	30·071	30·066	30·212	30·223	30·445	30·322	30·940	30·354	30·327
29·224	29·413	29·046	29·076	28·807	28·166	28·793	28·824	28·768	28·807	28·707	28·671
0·753	0·588	1·116	0·995	1·259	2·046	1·430	1·621	1·564	2·133	1·647	1·656
72	79	79	79	82	76	77	76	74	75	75	76
0·488	0·442	0·295	0·175	0·129	0·279	0·252	0·264	0·252	0·248	0·259	0·263
0·48	0·53	0·62	0·60	0·78	0·62	0·66	0·64	0·61	0·61	0·61	0·65
0·00	+ 0·04	+ 0·01	— 0·15	+ 0·03	+ 0·02	+ 0·06	+ 0·04	+ 0·01	+ 0·01	+ 0·01	+0·05
N. 75 w.	N. 29 E.	N. 85 w.	N. 89 w.	N. 89 w.	N. 45 w.	N. 64 w.	N. 57 w.	N. 60 w.	N. 73 w.	N. 66 w.	N. 76 w.
1·80	2·26	1·86	4·36	5·60	1·61	·55	1·47	2·05	2·83	1·98	2·49
5·92	5·04	7·11	8·74	11·46	7·33	7·20	7·69	7·00	7·41	6·78	7·40
+ 0·74	— 0·41	+ 1·03	+ 1·20	+ 2·95	+ 0·39	+ 0·26	+ 0·75	+ 0·06	+ 0·47	— 0·16	+ 0·46
3·422	6·794	2·690	0·594	2·430	33·898	31·182	29·408	19·041	34·209	26·599	29·486
+0·407	+3·100	+0·270	—2·476	+0·778	+4·374	+1·658	—0·116	—10·483	+4·685	—2·925	—0·038
14	11	16	6	6	116	115	103	100	126	111	132
...	...	...	3·1	15·9	122·9	84·6	78·7	110·5	52·1	63·3	74·6
...	...	— 0·93	+ 0·14	+ 1·82	+56·83	+18·53	+12·63	+44·43	—13·93	— 2·77	+ 8·53
...	...	...	5	16	77	81	82	84	69	68	70
17	19	15	20	13	185	180	190	181	180	201	180
12	8	5	8	4	77	47	50	43	44	55	34
26	21	20	19	10	206	182	193	202	209	201	158
6	4	1	1	...	34	32	25	23	24	17	24

TEMPERATURE.

	1870.	Average of 30 years.	Extremes.	
	°	°	°	°
Mean temperature of the year	45·93	44·10	46·36 in '46	42·16 in '56
Warmest month	July.	July	July, 1868	Aug. 1865.
Mean temperature of the warmest month	68·79	67·33	75·80	64·46
Coldest month	February	February	Jan. 1857.	Feb. 1848.
Mean temperature of the coldest month	21·54	23·02	12·75	26·60
Difference between the temperatures of the warmest and the coldest months	47·25	44·31	...	...
Mean of deviations of monthly means from their respective averages of 30 years, signs of deviation being disregarded	2·65	2·41	3·59 in 1843	1·31 in 1864.
Months of greatest deviation without regard to sign	June	January	Jan. 1857.	...
Corresponding magnitude of deviation	5·86	3·87	10·3	...
Warmest day	June 28	...	July 14, '68	July 31, '44
Mean temperature of the warmest day	77·70	77·74	84·50	72·75
Coldest day	Dec. 29	...	Feb. 6, '55 Jan. 22, '57.	Dec. 22, '42
Mean temperature of the coldest day	0·68	—1·11	—14·38	9·57
Date of the highest temperature	June 18	...	Aug. 24, '54	Aug. 19, '40
Highest temperature	88·4	91·0	99·2	82·4
Date of the lowest temperature	Feb'y 21	...	Jan. 10, '59.	Jan. 2, '42.
Lowest temperature	—6·6	—12·3	—26·5	1·9
Range of the year	95·0	103·3	118·2	87·0

BAROMETER.

	1870.	Average of 29 years.	Extremes.	
Mean pressure of the year	29·5956	29·6175	29·6670 in 1849.	29·5602 in 1864.
Month of highest mean pressure	Sept.	Sept.	Jan. 1849.	June. 1864.
Highest mean monthly pressure	29·7514	29·6658	29·8046	29·6525
Month of lowest mean pressure	February	May.	March. 1859	Nov. 1849.
Lowest mean monthly pressure	29·5315	29·5686	29·4143	29·5885
Date of highest pressure in the year	Jan. 14, 10 a.m.	...	Jan. 8, '66.	Jan. 14, '70.
Highest pressure	30·212	30·380	30·940	30·212
Date of lowest pressure in the year	Jan. 2, 9·30 p.m.	...	Jan. 2, '70.	Mar. 17, '45.
Lowest pressure	28·166	28·698	28·166	28·939
Range of the year	2·046	1·682	2·133 in 1866.	1·303 in 1845.

RELATIVE HUMIDITY.

	1870.	Average of 28 years.	Extremes.	
Mean humidity of the year	76	77	82 in 1851	73 in 1858
Month of greatest humidity	Jan. Dec.	January	Jan. 1857.	Dec. 1858.
Greatest mean monthly humidity	82	83	89	81
Month of least humidity	May.	May	Feb. 1843.	Apr. 1849.
Least mean monthly humidity	63	71	58	76

EXTENT OF SKY CLOUDED.

	1870.	Average of 17 years.	Extremes.	
Mean cloudiness of the year	0·62	0·60	0·66 in '69.	0·57 in '56
Most cloudy month	Decem.	Novem.	...	...
Greatest monthly mean of cloudiness	0·78	0 75	0·83	0·73
Least cloudy month	August	August	...	...
Lowest monthly mean of cloudiness	0·48	0·48	0·29	0·50

WIND.

	1870.	Result of 22 years.	Extremes.	
Resultant direction	N. 45° W.	N. 61° W.	...	...
Resultant velocity in miles	1·61	1·90	...	...
Mean velocity, without regard to direction	7·33	6·94	8·55 in '60.	5·10 in 1853
Month of greatest mean velocity	Decem.	March	Mar. 1860.	Jan. 1848.
Greatest monthly mean velocity	11·46	8·77	12·41	5·82
Month of least mean velocity	July	July	Aug. 1852.	Sept. 1860..
Least monthly mean velocity	4·82	4·96	3·30	5·79
Day of greatest mean velocity	Feb. 12	...	Mar. 19, '59.	Dec. 2, '48.
Greatest daily mean velocity	20·92	23 23	31·16	15·30
Day of least mean velocity	June 2	...	...	...
Least daily mean velocity	0·00	...	...	...
Hour of greatest absolute velocity	Oct. 18, 5-30 to 6-30 a.m.	...	Dec. 27, '61. 9-10 a.m.	Mar. 14, '53. 11 to noon.
Greatest velocity	35·3	39·4	46·0	25·6

RAIN.

	1870.	Average of 30 years.	Extremes.	
Total depth of rain in inches	33 898	29·525	43·555 in '43	19 041 in '67
Number of days in which rain fell	116·	109·	130 in 1861	80 in 1841
Month in which the greatest depth of rain fell.	June.	Sept.	Sept. 1843.	Sept. 1848.
Greatest depth of rain in one month	8·090	3·694	9 760	3·115
Months in which the days of rain were most frequent	June, July and Oct.	October.	Oct. 1864. June '69.	May, 1841
Greatest number of rainy days in one month	16	12	22	11
Day in which the greatest amount of rain fell	June 11	...	Sept. 14, '43	Sept. 14, '48
Greatest amount of rain in one day	2·360	2·054	3·455	1·000

SNOW.

	1870.	Average of 27 years.	Extremes.	
Total depth in the year in inches	122·9	66·1	122·9 in '70.	38·4 in 1851
Number of days in which snow fell	77	62	87 in 1859	33 in 1848
Month in which the greatest depth of snow fell	March	February	March. 1870	Dec. 1851
Greatest depth of snow in one month	62·4	19·14	62 4	10 7
Months in which the days of snow were most frequent	Jan. Feb. and Mar.	January	Jan. 1861	Feb. 1848
Greatest number of days of snow in one month.	18	14	23	8
Day in which the greatest amount of snow fell.	March 27	...	Feb. 5, 1863 Mar. 27, '70.	Jan. 10, '57.
Greatest fall of snow in one day	16·0	8·9	16·0	5·5

PERIODICAL OR OCCASIONAL EVENTS—1870.

January 19. Bay frozen. The bay had been previously frozen, (Dec. 8, 1869); but the ice was broken up on the following night.
March 27. Very severe snow storm; ice broken and almost driven from the bay by the gale.
April 1. Some attempt at sleighing.
" 2. Schooner arrived, and left with a cargo.
" 5. First steamer arrived.
" 5. Last snow of season.
" 19. Ploughing in vicinity.
" 22. Swallows arrived.
May 13. Last frost and ice of season.
Aug. 19–25. Swallows moving, almost gone by 25th.
" 27. Frost at an early hour.
October 19. First recorded ice.
" 24. } Much like Indian Summer.
Nov. 1 & 2. }
" 7. Grasshoppers numerous.
" 10. First snow of season
Decem. 3. Butterflies seen.
" 12. First heavy snow storm.
" 22. Bay frozen over.
" 29. Coldest day of year.

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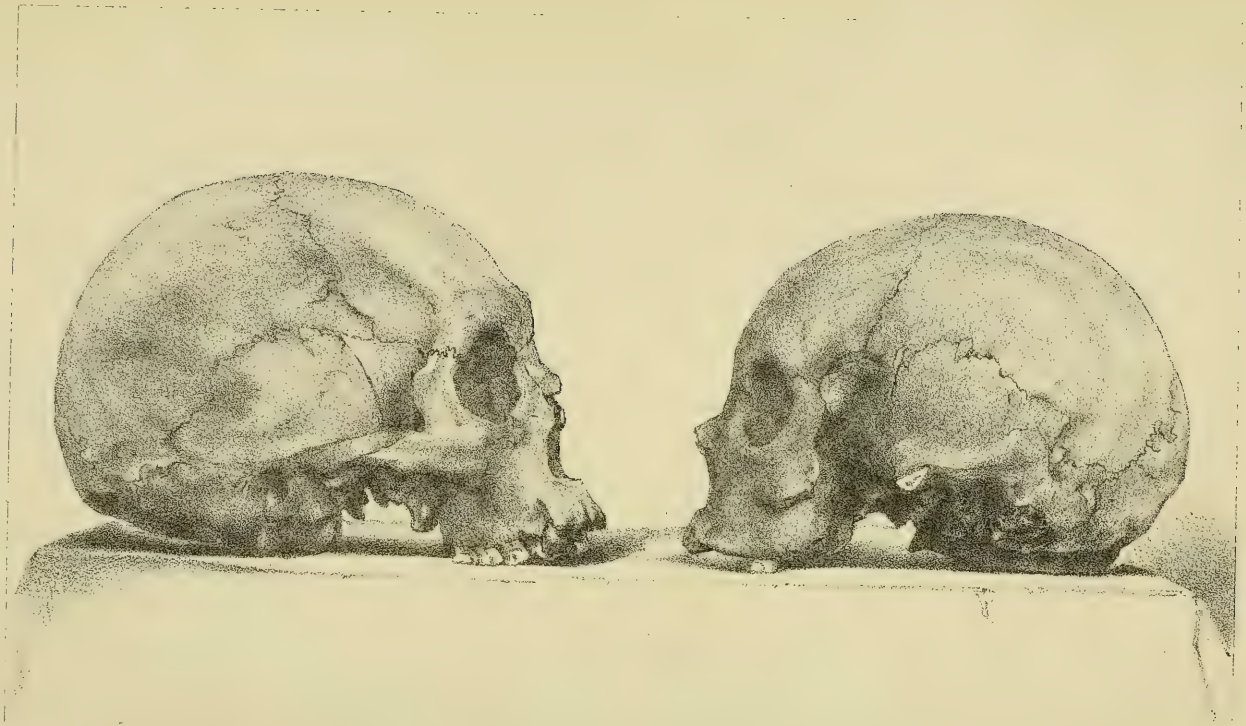
Plate I



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THE CANADIAN JOURNAL.

NEW SERIES.

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THE HURON RACE AND ITS HEAD-FORM.

BY DANIEL WILSON, LL.D.

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Read before the Canadian Institute, 8th April, 1871.

In Europe we not only discern certain well-defined groups, of distinct ethnical character, within the great Aryan family of nations; but also Moorish or Arabian, Hungarian, Turkish, and other intrusive elements of comparatively modern origin; ancient Basques, Fins, and Lapps, of essentially diverse classification; and far beyond all, in point of time, Allophylians of diverse types: the barrow and cairn-builders of prehistoric times. The varying elements of race thus indicated, are accompanied by corresponding diversities in their stages of progress and phases of civilization. There is no risk that any crude generalizations should there shape themselves into a theory of ethnical homogeneity.

On the American continent it is wholly different; and by its very contrast to Europe in all that pertains to ethnographic classification, the actual extent of its diversities is apt to be ignored. The interval between the most advanced arts of Mexico or Peru, and the barbarism of Patagonia or Greenland becomes so slight, by comparison, as to be undervalued; and the ethnologist is left to search out the traces of distinctive diversity, in part by comparative study of the languages of the New World; and in part by determination of the physical characteristics of its races. As yet the materials for any comprehensive system of generalization are wanting. The following monograph on

an Indian race, the type of one great division of the American aborigines, which, in its various subdivisions, occupied extensive regions of the Northern continent, and for fully two centuries affected the course of events by which its later history has been determined, may help as a slight contribution to the materials for future classification.

The history of the aboriginal tribes originally found in occupation of the St. Lawrence valley and Western Canada strikingly illustrates the instability of savage nations. There is little doubt that the Indians found by Cartier at Quebec and Montreal, in 1535, belonged to the Iroquois stock. But the early French Missionaries learned from them traditions of the ancient superiority of the Algonquins; and before the close of the sixteenth century the latter had displaced them on the island of Montreal and in the lower valley of the St. Lawrence. Thenceforth their hunting grounds lay to the south of that river; and the country of the Five Nations, into which they were divided, extended between the Hudson and the Genesee rivers, along the southern shore of Lake Ontario; Lake Champlain was commanded by them; and the French were compelled to erect a strong fort at the mouth of the Richelieu to check their hostile expeditions into the St. Lawrence.

There is reason, however, for assuming that the Iroquois of Lower Canada on retiring to Western New York, did not thereby occupy for the first time the country of their later home; but only joined themselves to another branch of the same stock. The traditions of three of the members of their later confederacy recognised no precursors in the occupancy of their territory. According to the settled faith both of the Onondagas and the Senecas, they were autochthones, sprung from the soil on which they then dwelt; while the Oneidas cherished a sacred legend, connected with their own Caaba, or Holy Stone, which told that the Onondagas and Oneidas sprang together out of the ground, on the banks of the Oswego river.

In the region thus claimed as the mother earth of three of the Iroquois nations, they dwelt through all the period of their authentic history, uniting in a remarkable federal league, Oneidas, Onondagas, Cayugas, Senecas, and Mohawks. To this a sixth nation: the Tuscaroras; was admitted, on their expulsion from North Carolina in 1715, The term nation, as thus applied to the subdivisions of the Iroquois. Hurons, and other Indian races, is apt to suggest an exaggerated idea of numbers. The word sept, clan, or tribe, would better express the

actual condition of things; but long use has thoroughly established the application of the more comprehensive term. The descendants of the Iroquois, now settled as a comparatively civilized people, on the Grand River, in Western Canada, are universally known as the Six Nation Indians. Their overmastering fury in the sixteenth and seventeenth centuries no doubt included along with its savage elements, the germ of a more enduring force. Fearless and implacable in their hostility, they arrayed themselves from the first in opposition to the French colonists; and as they and the rival colonists of English origin were long nearly equally balanced, it is not unjustly affirmed that the failure of the magnificent schemes of French colonization in North America is directly traceable to their uncompromising antagonism.

The name *Iroquois*, of French formation, is derived by Charlevoix from the word *hiro: I have said*, with which the Indian orator was wont to finish his speech, and a cry of acclamation, *koué*, nearly equivalent to our *hear*. Their own generic name was *Hodenosaunee*, or People of the Long House, expressive of the numerous assembly in the Council of the Confederacy. Thus united, the Iroquois were the great aggressive nationality of the American continent, in the seventeenth century. In the very beginning of that century, Captain John Smith, the founder of Virginia, encountered their canoes on the upper part of Chesapeake Bay, bearing a band of them to the territories of the Powhattan confederacy. All the tribes whose hunting grounds brought them in any degree into contact with the Iroquois, were, one after another, exterminated or reduced to the condition of dependent tribes. Even the Canarse or Long Island Indians found no protection from them in their sea-girt home beyond the Hudson; and their power was felt from the St. Lawrence to Tennessee, and from the Atlantic to the Mississippi.

The Iroquois confederacy is a remarkable feature in the history of the American aborigines, for it was no temporary union, effected for a special war, and stimulated by the pressure of immediate danger; but a league which for nearly two centuries made the confederates a formidable power, not only against their native foes, but in opposition to the aggressive schemes of French, Dutch, and English colonists. But in spite of all their sagacity and long endurance, the Iroquois were in a purely savage state, and powerful only to destroy. Could they have realized the full value of their confederacy, and extended it to embrace neighbouring nations of kindred race, a new Cortes would have been

needed to win the regions of Canada and Western New York for their modern occupants. But so far as arts are any test of native progress, they had not yet emerged from the primitive stage of forest life. Of working in metals they knew nothing; and only supplemented their weapons and implements of stone, flint, horn, bone, or wood, by barter with the European intruders; and chiefly with the Dutch settlers at Rensellaerswyck, as Albany was then called. By rare chance they acquired copper axes and lance-heads, through indirect agency, from Lake Superior; but when the competition among the fur-traders on the Hudson became great, they readily obtained from them, not only knives, iron axes, copper kettles, beads, and cloth, but guns and powder; and thus achieved enormous superiority over all native antagonists.

The antagonism between the Iroquois and the Adirondacks, of Algonquin lineage, is not difficult to account for. Their languages indicate a wide divergence of race; and Iroquois traditions told that while they were still comparatively few in number, they had been subjected to cruel oppression, and finally driven from ancient hunting grounds on the River St. Lawrence, by their Algonquin foes. But with the Indian nations around Lakes Ontario and Erie it was otherwise. Hurons, Petuns, Neuters, and Eries, appear from such evidence as we possess, to have been kindred nations, speaking closely allied languages, and altogether greatly outnumbering the Five Nations of the Iroquois. A league which embraced them all might have long set both France and England at defiance; but their diplomacy was directed by no wise foresight, and the lust of conquest and revenge alone stimulated them to action. It is indeed a striking illustration of the unstable condition of savage life, that we can trace to native wars of so recent a date as the sixteenth and seventeenth centuries, the depopulation of the whole country between Montreal and the Georgian Bay; while far to the southward of the great lakes, the aggressive Iroquois had eradicated ancient nations long before European colonists intruded on their conquests. The mountain chain of the Alleghanies perpetuates the name of the oldest tribe within the area of the United States of which there is a distinct tradition. But the name alone remained when the present occupants entered on their ancient inheritance. The traditions of the Delawares told that the Alleghans were a powerful nation reaching to the eastern bank of the Mississippi, when they themselves first came from the far west into the great valley

But the Iroquois combined with the Delawares, or Lenapé Nation, to crush that ancient people. After vainly struggling to withstand the united foe, the surviving remnant were driven down the Mississippi, and their name disappeared from among the Indian nations of the continent. They had long occupied populous towns and villages in the Ohio valley; and are even assumed by Mr. Schoolcraft, in his "History of the Indian Tribes," to have been the actual Mound-Builders. But, whoever they were, the very name of the Ohio is of Iroquois origin, and given to the native river of the Allegans by their supplanters. The Andastes, or Susquehannocks, who are believed to have been a kindred people, and acknowledged an ancient friendship with the more distant Hurons, excited the ire of the Iroquois, and were in like manner extirpated. At a later date the Delawares, with whom they had been in temporary league, fell under their ban; and a miserable remnant of survivors abandoned the shores of the beautiful river which perpetuates their name, and wandered back into the unknown west. So in like manner, the Shawnees, Nanticokes, Unamis, Minsi, and Illinois, were vanquished, and for the most part driven out or exterminated. Settlements of the conquerors were frequently established in the conquered lands; and the only redeeming feature in this savage warfare was their system of adopting prisoners of war in the place of lost members of their own tribes; and of admitting to a species of serfdom the surviving remnant of conquered nations. This process of admixture of native races will form a legitimate subject of review when considering different cranial types recovered from the cemeteries of the allied Hurons.

The nations thus driven out or exterminated were probably all of diverse affinities from their conquerors. But a comparison of the dialects of the Iroquois language with those of the tribes of Western Canada shows that they were of kindred stock. Yet this proved no protection. The first explorers of the St. Lawrence found the occupants of the country little better than ephemeral nomades; and their extermination or displacement is wholly ascribable to native wars. In the brief interval between Cartier's first discovery of Canada, in 1535, and its exploration and settlement by Champlain, the whole country between the Ottawa and Lake Simcoe appears to have been depopulated; and the surviving *Ouane-doté* or Wyandot tribes, driven westward by the implacable Iroquois, found new hunting grounds, or mingled with nations of a common affinity, in the country to the north of Lake

Erie. Of these, the Hurons, when first brought to the knowledge of the French, were found settled in palisaded villages around Lake Simcoe,—or Ouentarono, as it appears to have been called.

The name Huron, like that of Iroquois, is of French formation, though of more uncertain origin. "*Quelles hures!*" exclaimed an astonished Frenchman, at the sight of a party of them decorated according to their highest savage art: and hence, says one of the Jesuit fathers, came the name. Another derivation traces it to the *koué*, or familiar ending of all Indian orations, already referred to, and the common termination *ono*, or *onon*, as the French give it, signifying people. They appear to have called themselves Ouendat, or, according to English pronunciation, Wyandots. They consisted of four septs or nations: the Attignaouentans, or Nation of the Bear, — the chief member of the league,—the Attignenonghaes, the Ahrendarrhonons, and the Tohotaenrats: occupying thirty-two villages, when visited by the Jesuit Missionaries, in 1639. To those a fifth nation: the Tionnontates, or Tionontones, was united at a later date. But the term *nation* is apt to lead to an exaggerated idea of numbers. Brébeuf reckoned them in all, in 1635, at thirty thousand; and they are stated in the Relation of 1660 at thirty-five thousand. The five nations of the Iroquois were estimated by La Hontan, about the same time, as numbering in all seventy thousand; but all such estimates were necessarily based on very imperfect data. The number of Huron towns changed from time to time under the vicissitudes of war and disease; and the Tohotaenrats only occupied a single pallisaded village.

Agriculture was sedulously pursued by all the members of the confederation; and indeed one of the hardships dwelt on by the French Missionaries who visited their villages is that they could rarely get any animal food; but lived principally on *sagamité*, a preparation of pounded Indian corn and smoked fish boiled together. A pumpkin baked in the hot ashes, or Indian corn roasted in the ear, varied such entertainment in the autumn; and when the Jesuits settled among them as a permanent mission, they learned to hunt for themselves. The rivers and lakes of the Huron country still abound in fish; nor is the game even yet exterminated in neighbouring regions. But the untiring vigilance of their Iroquois foe greatly restricted their hunting grounds, and forced them to the diligent cultivation of the soil. To this was probably due such traces of incipient civilization as are suggested to us by numerous traces of systematic agricultural labour.

But whatever may have been its true source, it is certain that they possessed a knowledge and experience in agriculture wholly independent of European influence, and that they carried it into practice to an extent which has not been attained by the Algonquin Indians since settled on the Indian reserves of the deserted Huron country.

To the south-west, between the Georgian Bay and Lake Erie, the allied nation of the Tiontonones dwelt, and they also carried on agricultural operations on a scale which suggested the name of Petuns, given to them by the French, from the extent to which they cultivated tobacco. The Niagara district was in like manner filled up by the Attiwandaronks, or Neuters, of the same stock; and all along the river banks and smaller lake shores, traces of Indian villages and cemeteries prove that the country was formerly filled with a corresponding native population. But the Wyandots or Hurons only became known to Europeans in their decline, and immediately before their extirpation. They were then in alliance with the Adirondacks and other Algonquins, against their common Iroquois foe.

The Mississagas, Ottawas, Nipissings, and Adirondacks, all belonged to a distinct stock; and to them, as to all nations speaking languages unintelligible to the Hurons, they applied the common name *Akwanake:* corresponding to the Teutonic application of the term *Welsh*. But to the people occupying the Niagara peninsula,—notwithstanding the neutrality the latter maintained in the wars between them and the Iroquois, which led to their being designated by the French *The Neuters*,—the Hurons gave the name of *Attiwendaronk*, signifying, according to Brebœuf, a "*people of a language a little different.*"

Beyond this, on the south west, lay the extensive region of the Eries, another allied race, whose elaborate rock-sculpture on Cunningham's Island, Lake Erie, attracts interest as the most elaborate pictorial inscription of its class hitherto found on the Northern Continent But both Neuters and Eries perished by the violence of kindred nations before any accurate knowledge could be obtained of either. The year 1655 is assigned by Charlevoix for the destruction of the former. Of the latter so little is known that in the earliest French maps an imaginary river connects Lakes Huron and Ontario; the very existence of Lake Erie being then unknown.

It was otherwise with the Huron's country. It was visited by Champlain himself in 1615; and in the latter part of the seventeenth century became the scene of the indefatigable operations of a succession

of missionary fathers, some of whom divided their self-denying labours between them and their Iroquois foes, and several suffered martyrdom at the hands of the savage nations whose conversion they aimed at. Minutely detailed maps and narratives of exploration and missionary labours, record the progress of discovery in the region around the Georgian Bay; and illustrate the topography of the Huron villages so accurately, that most of their sites have been identified in recent years. Dr. J. C. Taché devoted such leisure as he could command during a period of five years, prior to 1865, to a minute exploration of the Huron country. Following in the steps of early writers whose accounts are preserved in the *Relations* of the Jesuit Fathers, communicated to the Provincial of the Order at Paris, from 1611 to 1672, he was able to determine the sites of their principal villages, and to explore their cemeteries, abounding with implements, weapons, and numerous other archæological records of native arts and habits.

The sepulchral rites of the Hurons were of a peculiar character. Their dead were primarily exposed on raised biers, as is still done by the Cowlitz, Columbia River, and other tribes; and around them were hung implements and personal ornaments of the deceased, with the tributes of affection of the survivors. In the case of death on a journey, or on the war-path, the body was temporarily interred. But the place of sepulture was carefully noted for future transfer of the bones to the general cemetery of the tribe. At intervals of ten or twelve years the great "Feast of the Dead" was celebrated by each nation of the Huron confederacy. One of these grand ceremonies, performed at Ossossané, the chief town of the Bear Nation, on Nottawasaga Bay, was witnessed by the Jesuit Missionaries, in 1636. Skeletons were gathered from old scaffoldings or disinterred from distant graves, by the relations of the deceased. The bones of those more recently dead were cleansed of the remaining flesh; and then wrapped carefully in skins, and adorned with prized decorations. The old wampum-belts, pipes, kettles, bows, arrows, axes, beads, and shells, which had been hung around the bier, or deposited in the grave, were anew gathered together; and the whole were brought to the appointed cemetery. There a great trench was dug, and carefully lined with beaver skins and other furs; and after a funeral-feast, with lamentations by the women, and orations by some of the chiefs in praise of the dead: the relics of mortality were cast into the trench, along with the funeral offerings. Only in cases of recent death were the corpses wrapped in furs and deposited entire;

and then, amid the shrieks and wails of the mourners, the earth was thrown in, logs and stones piled over the cemetery, and with a closing funeral chaunt, the Great Feast of the Dead was brought to an end.

Peculiar as these sepulchral rites of the Hurons and other American Indian tribes were, they are not without some parallel in the old world. Captain Thomas, R.N., in exploring a subterranean chambered catacomb at Taransay, in the Island of Harris, in the Hebrides, found a number of human skulls and bones so arranged as to prove that they had been deposited there long subsequent to death. Mr. Thomas Bateman, also, in his "Ten Years' Diggings in Celtic and Saxon Grave-hills," describes the discovery, in the centre of a large barrow, near Youlgrave, Derbyshire, enclosed in a rectangular stone cist, of the bones composing the skeleton of an aged man, carefully arranged in a heap, the long bones laid parallel with each other, and the whole surmounted by the skull. The bones were so perfect that Mr. Bateman adds, "it is evident this arrangement had been made while they were fresh and strong." An imperfect skeleton found in one of the Cromlechs discovered in the Phœnix Park, Dublin, in 1838, had also, in the opinion of Dr. Robert Ball, been collected from some other place and deposited there. It is to be noted, however, that the two latter cases were accompanied by other interments, where the bodies had been buried in the flexed posture common in early British sepulture. Among the Hurons, on the contrary, inhumation was the exceptional mode of disposing of the dead, and for the most part only temporary.

Owing to the systematic practice of thus gathering together the remains of the Huron dead, one or more ossuaries were to be looked for in the vicinity of each Huron village. Dr. Taché explored sixteen of them in all, containing from six hundred to twelve hundred skeletons each. From the same depositories he also recovered numerous specimens of native art, and illustrations of the peculiar customs of that people. Among them are included implements, weapons, pottery, stone-pipes, clay-tubes, large tropical shells specially prized by all the northern tribes, the native wampum, kettles, knives, and personal ornaments of copper, beads, and other relics of European workmanship. One prized object of the latter class is a fragment of one of the Jesuit Mission church-bells. Dr. Taché is also of opinion that some of the copper articles are of Mexican origin. There is no doubt that a traffic by the Mississippi route furnished them, through indirect barter, with

the shells of the Mexican gulf of which their wampum was wrought. But most of the hammered copper tools found in Canada have been identified by their included silver crystals, with the copper of Lake Superior.

From the large pyrulæ of the gulf the Iroquois and Hurons not only made their wampum, but the largest shells were frequently carved, hung with scalp-locks and other favourite decorations, and carefully preserved as objects of superstitious reverence. From the same cemeteries, Dr. Taché selected upwards of eighty skulls, most of which, with the accompanying relics, he deposited in the Museum of the Laval University, at Quebec.* There, I have enjoyed opportunities of inspecting the collection; and, with the help of my friends, Mr. John Langton and the Rev. James Douglas, minutely examined and measured some of the most remarkable of the skulls. In his explorations, indeed, Dr. Taché has anticipated a favourite project of Mr. Langton. An interesting paper "On the early discoveries of the French in North America," communicated by him to this Journal in 1857, specially illustrates the topography of the Huron country; and he had then conceived the idea of identifying the localities of the chief Huron towns. The site of one of them, Ste. Marie, at the mouth of the Wye, being well defined, and some of the others approximately, it seemed by no means improbable that their positions could be determined anew, and tested by the very process successfully adopted by Dr. Taché. He has succeeded in tracing out the sites of fourteen villages, on many of which remains of the houses and stockades could still be recognised. One of them he has identified as St. Ignace, where the principal chief and nearly a hundred of the Iroquois warriors fell, before the Hurons were overpowered, and the miserable remnant bound to stakes, to perish in the flames of their blazing settlement. From the mound of charcoal and ashes, Dr. Taché collected numerous pieces of pottery, trinkets, and stone implements, that had lain buried in the ruins of St. Ignace ever since its final destruction in 1649. More recently I have obtained, from Dr. Thorburn, of Toronto, the fruits of later explorations in the ossuaries of the same Huron country, including eleven additional skulls. The materials thus brought under review are therefore ample for the determination of some definite results as to the prevailing forms of the Huron or Wyandot cranium.

* Dr. Taché presented ten Huron skulls to the London Anthropological Society.

In addition to the detailed narrations of Indian history and manners derived from the Jesuit *Relations*, the Hurons present some specialties that suggest the probable deduction of more trustworthy results from a study of their remains, than from those of other tribes displaced or exterminated during the brief historic period of the American continent. They were first visited by Champlain in 1615. In 1649, their country was desolated by the Iroquois, and the miserable remnant finally dispersed. No survivor remained within their ancient territory. Some found refuge among the kindred Petuns, Neuters, and Eries, and shared in their subsequent fate. The fortunes of another body of the fugitives curiously illustrates the Indian practice of adoption. The survivors of two of the Huron towns opened negotiations with their Seneca foes, whose country lay nearest of all the Five Nations to their own. The victors adopted them into the Seneca Nation; and, joined by a few other Huron refugees, they founded a town of their own in the Seneca country, on one of the small lakes of Western New York, to which they gave the name of Gandougaraé. Thenceforth they were identified with the Iroquois, and disappear, as a separate people, from the ranks of the Aborigines. Another band, under the conduct of the Jesuit Missionaries, made their way to Quebec; and there, after various vicissitudes, they were at length settled at Lorette, on the St. Charles river, where their lineal descendants still preserve some living memorial of the lost nation of the Hurons. But their native language has been exchanged for a French *patois*, and their blood so intermingled with that of the European colonists, that but for the interest they inherit in the division of certain Indian funds, they would long since have merged into the general population, and ceased to be distinguished from the French habitans by whom they are surrounded.

The admixture of blood which has thus nearly effaced the genuine characteristics of the Hurons of Lorette, has more or less affected the descendants of the Iroquois, and of all the aboriginal native tribes of Canada and the region to the south of the great lakes. The remains, therefore recovered from the ancient cemeteries of the Huron country, which was finally abandoned in the first half of the seventeenth century, have a special value for ethnological purposes. They are free from the vitiating influences affecting tribes long in contact with European colonists; and may be assumed to exhibit whatever characteristics specially marked this isolated people. Nevertheless it has to

be borne in remembrance that the system of adopting members of other tribes, by which, as has been seen, they profited to escape utter extermination by their Iroquois foe, was also a practice of their own; though on a much less extensive scale. The Iroquois, throughout the whole period in which their history is known to us, were a warlike, aggressive race, constantly encroaching on their neighbours, and glad to recruit their numbers by the adoption, not merely of captives, but by admitting both friendly and conquered nations of widely different origin, into their confederacy. The Hurons, on the contrary, occupied a comparatively isolated region; acted mainly on the defensive; and within the period of definite Indian history, were augmented at most by the adoption of occasional captives, at the will of individuals, who thus chose, according to native custom, to supply the place of some lost member of a family. Both indeed were actuated by the same idea, and aimed at recruiting their numbers, diminished by the waste of war, by adopting prisoners, after their revenge had been sated by the torture of a sufficient number of selected victims; nor did even such extreme ethnical diversity as that of the European constitute an insurmountable impediment to such affiliation. But the motives which tempted weaker nations to join the Iroquois were wanting in the case of the Hurons. There are, therefore, strong grounds for anticipating an approximation to purity of race among the Hurons of the well-defined period illustrated by the contents of their cemeteries on the Georgian Bay, which it would be rash to assume in reference to similar evidence derived from any Iroquois ossuary. So little did differences of race interfere with affiliation among the latter, that an aged squaw of pure white blood, reputed to be nearly a century old, survived till recently,—if she does not still live,—as a member of the Mohawk tribe on the Bay of Quinte. Her Indian name is Ste-nah, which is supposed to be a contraction of the name Christina. She is described to me, by an educated Mohawk Indian, as a full blood Sko-ha-ra, or Dutchwoman. She was taken by the Mohawks when a child, during the Revolutionary war, and when I heard of her last, in 1868, was living with her granddaughter, the wife of a Mohawk chief. To this ready adoption of foreigners into their tribes may be due in part the occurrence of very diversified head-forms among the crania recovered from Iroquois and Huron ossuaries. Keeping in view the facts thus indicated, I proceed to record some results derived from a study of the examples submitted to examination.

In an earlier enquiry into the specialties of the Huron skull, my observations were based on the examination of twenty-nine crania derived from the Huron country; including a remarkable skull from an ossuary at Barrie, on Lake Simcoe, subsequently figured and minutely described in this Journal.*

To the examples thus brought under review, I was able to make further additions, so as ultimately to embrace in one table, as probable Huron crania, the measurements of thirty-seven skulls obtained from Indian graves in the localities to the north of the water-shed between Georgian Bay and Lakes Erie and Ontario; and the greater number of them from ossuaries opened within the area lying between Lake Simcoe and Lake Huron, where the Hurons were visited by French explorers and Jesuit missionaries in the seventeenth century. The materials thus turned to account appeared to embrace a sufficient number of examples to illustrate the average proportions and relative measurements of the Huron cranium, and to furnish satisfactory data for comparison with those of other Indian nations. The comparisons, however, were chiefly carried out with a view to test the assumed Mortonian type of a uniform American head-form. Of the crania submitted to examination, the Barrie skull, which attracted attention by its striking contract to the rest of the group, proves to be altogether exceptional. Studied alone, like the famous Scioto Mound skull, it would have seemed to furnish conclusive confirmation, in relation to Canada, of the assumed remarkable sameness of osteological character pervading all the American tribes from Hudson's Bay to Terra del Fuego. Indeed the description which Dr. Morton gives of the famous mound skull, as "the perfect type of Indian conformation to which the skulls of all the tribes from Cape Horn to Canada more or less approximate," would equally apply to some of the most characteristic features of the one from the Barrie ossuary. It only lacks the great vertical elevation; though this is made to appear less than it actually is, owing to the unusual depression of the fossa in the foramen magnum, which constitutes a fixed point of measurement. The striking agreement of the two, when viewed in one most characteristic aspect, will be seen from the accompanying wood-cuts.

* Canadian Journal, vol. vii, p. 406.

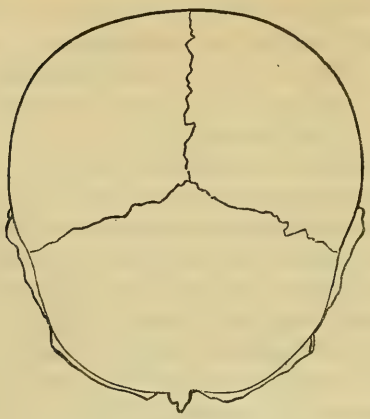


FIG. 1. SCIOTO MOUND SKULL.

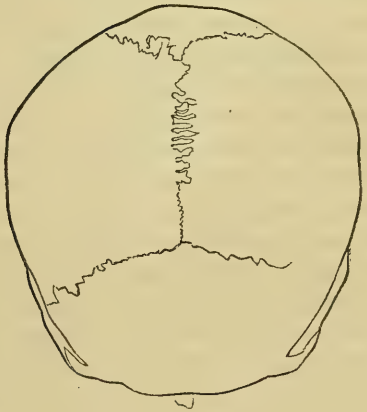
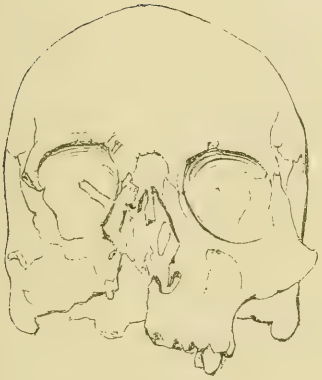
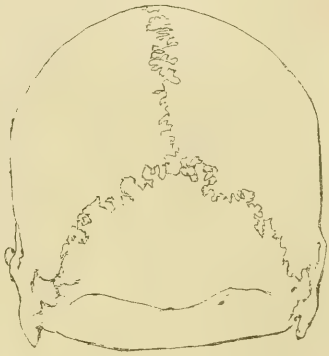


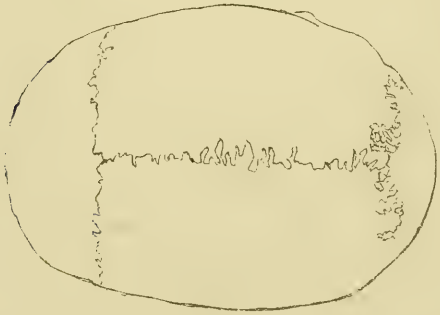
FIG. 2. BARRIE SKULL.

The lower jaw in the Barrie skull, as shown in a former illustration, markedly contrasts with the usual square and heavy proportions of the Indian face. But the means of comparison are wanting in that of the Mound-Builder.* In reality, however, out of one hundred and twenty-six crania from the same district that have come under my observation, no other example in any degree resembles the Barrie skull in its peculiar features. It is altogether unique as a Canadian skull,

* Canadian Journal, vol. vii, pl. 2, p. 399.







and, though discovered in the country of the Hurons, is more probably the relic of one who found a grave there, remote from those of his own people. In so far as fashion regulated the varying forms produced by compression in infancy, its shape suggests a possible intruder from the country lying towards the mouth of the Mississippi, where the ancient graves of the Natchez tribes disclose many skulls moulded into approximate forms. No note has been preserved of the general character of the crania, upwards of two hundred in number, discovered at the same time; but this one no doubt owes its selection to its peculiar form.

This is an element of "natural selection" which must materially affect the value of such collections of crania as that of Dr. Morton, for determining ethnical characteristics. In every case of the exposure of a considerable number of skulls, as in the opening of a large ossuary, the ordinary collector will naturally choose the largest, and in the case of any remarkable abnormal varieties, the most striking and unfamiliar forms. Where the choice lies between only three or four examples, the same process of selection will still operate; and thus results derived even from so numerous a collection as that of the Academy of Natural Sciences at Philadelphia,—including in all upwards of a thousand skulls,—may prove greatly to exceed the normal average, or even to rest at times on purely exceptional evidence.

I have referred to the contrast in vertical elevation of the Barrie skull, when compared with that from the Scioto Valley mound. But it is in the remarkable developement of the frontal bone that that celebrated cranium differs most strikingly from all of the common Indian type. It has been lithographed of its full size in Messrs. Squire & Davis's "Ancient Monuments of the Mississippi Valley," but unfortunately with more care on the part of the draftsman for artistic execution than accuracy of outline. A careful examination of the original considerably modifies the impression suggested by the drawing.* On viewing it from above, as shown in Fig. 1, it presents the peculiar characteristics of the truncated skull-form in its most marked aspect, passing abruptly from a broad flattened occiput to the extreme parietal breadth, immediately behind the external angular process of the frontal bone. So far, as will be seen from the outlines of the two, it does not greatly differ from the Barrie skull, Fig. 2. But its most character-

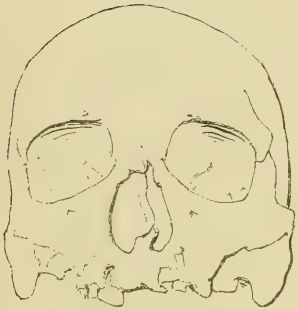
* A wood-cut of the Scioto Mound Skull in the same aspect as the full-sized lithographic view in the "*Ancient Monuments of the Mississippi Valley*," but executed for me from a photograph of the original skull, has been already given. Ante Vol. xiv, p. 276.

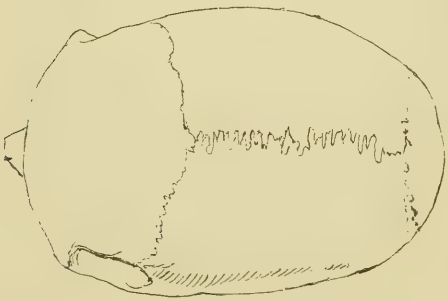
istic feature, in which it differs from all other Indian crania that I have studied, is the great elevation of the forehead. The frontal bone is fully arched, the glabella are prominent, and the whole character of the frontal region is in striking contrast to the ordinary native American head. In this respect there is comparatively uniform agreement throughout all the Huron crania. They are true Indian skulls of the modern type, with no indications of cerebral development adapted to any higher stage of civilization than that which is known to have pertained to them and other kindred tribes.

If the Scioto Mound skull could be accepted with certainty as illustrating an ethnical type, it would help to confirm the most exaggerated estimates of the civilization of the Mound Builders. Assuredly it is not what Dr. Morton assumed it to be: "the perfection of Indian conformation," possessing the national characteristics of the American aborigines in perfection. But if it be any fair example of the head-form of the constructors of the great earth-works and other remains abounding in the Ohio valley, it is highly suggestive of the superior intellectual capacity by means of which they had advanced beyond the rude arts of such forest tribes as those of the Iroquois and Huron confederacies.

The indefatigable researches of Dr. Taché might be supposed to furnish materials for determining the Huron type of head beyond all controversy. To the experienced craniologist, however, it will be no matter of surprise that they rather suggested, when first seen, some doubt as to there being any specific Huron type. But, at any rate the materials thus furnished, with later additions from other sources, admit of a review of the whole question, with a view to results of somewhat wider significance than those aimed at in a former study of Iroquois and Huron crania.

The sight of upwards of seventy skulls, all derived from the cemeteries of a single tribe or nation, is a peculiarly interesting study to the ethnologist. But to one at all impressed with the uniform persistency of a specific ethnical type, the result is far from satisfactory. At the first glance it seemed as though they might be classed into half a dozen types, having very little in common. The separation by sex reduced this seemingly wide range of diversity within narrower limits. But there still remained to be noted various diverging forms, and especially sundry long oval skulls, which viewed in reference to the cranial, apart from the facial bones, not only differed essentially from that Mongolian type usually assigned to the American aborigines; but presented





ca. Clarke

no clearly recognizable Indian character. Among the numerous crania from this one region of Canada, examined by me from first to last, the Barrie skull, with its flattened vertical occiput, and its brachycephalic proportions, remains unique. There is scarcely a trace, among all those in Dr. Taché's collection of a flattened occiput. Many of them are noticeable for its prominence; and in the female skull especially the tendency is repeatedly towards such a decided projection of the occiput as attracted my notice in examples previously described from the same district. In one case, indeed, the occiput presents a wedge-like protrusion in profile. But the specialties of the whole, in their front aspect, suggest a greater uniformity in physiognomy than in cranial conformation. The nose is in most cases large and prominent; the superciliary ridges in the males are strongly developed; and a common ethnical character may be traced in the full-face as a whole, including the massive, broad cheek-bones and superior maxilla; as well as in the indications in the greater number of a tendency towards a pointed apex, or meeting of the parietal bones at an angle at the sagittal suture.

Of the inferior maxillæ only detached examples are generally recoverable, owing to the circumstances under which the bones were originally gathered together to be deposited in the common ossuary. Only in the rare cases of interments of the bodies of those recently dead is the skeleton met with entire; and of the numerous skulls obtained by Dr. Taché, the lower jaws of only two of them could be identified, although he brought away with him, in all, twenty-six specimens. In their general character they present the massive rectangular ramus, and the square orthognathic jaw, characteristic of the North American Indian.

Dr. J. Aitken Meigs describes the skull of a Huron chief in Dr. Morton's collection, and figured in the *Crania Americana*, pl. 37, as "a massive, strongly marked, and brutish skull. The forehead is flat and receding; the superciliary ridges very prominent; superior maxilla everted; lower jaw ponderous and flared out at the angles, after the manner of the typical Eskimau skull; malar bones projecting; ossa nasi much incurvated; junction of parietal bones ridged or keel-like; skull rather narrow, occipital protuberance pretty well marked; anterior bregmatic region elevated, giving an arched outline to the whole head; occipital flatness in the upper part of the posterior region."* Dr.

* Proceed. Acad. Nat. Sci. Philad. vol. xviii, p. 220.

Meigs further remarks: "In its general configuration, as viewed laterally, it resembles the Creek and Chetimache skulls, but differs from them in general elevation of crown. This coronal elevation is shown also in the other three skulls" in the Morton collection, and he adds: "they are all short skulls." In reality, none of the examples referred to can be regarded as unmodified examples of the Huron head. The Wyandots of Detroit were the descendants of the Petuns, who, after they were driven out by the Iroquois, settled for a time on the Island of Mackinac, at the mouth of Lake Michigan, where they were joined by Ottawas and other Algonquin fugitives who had experienced a like fate. Driven forth from this refuge, they migrated from place to place, mingling for a time with the Illinois, another Algonquin people; and finally removed to Detroit and Sandusky, where, under the name of Wyandots, they were settled at the beginning of the present century. They retained the traditions of their fathers, and were among the most formidable of the Indian tribes who joined the famous Ottawa Chief, Pontiac, in 1763, in a war of extermination against the English. The skull figured in the *Crania Americana*, and minutely described by Dr. Meigs, is that of a Wyandot chief, killed near Detroit in a rencontre with another Indian. But it is not only inferior to the general character of Huron skulls; but both it and the other examples in the Philadelphia collection indicate such deviations from any prevalent Huron type as was to be looked for from the history of the Petun-Wyandots, subsequent to their migration from their original settlements.

On Plate I, are presented fair average specimens of the male and female Huron head. The male example, on the left, illustrates the prevailing characteristics of the larger number of the skulls as seen in profile. The supercilliary ridges are prominent, though less so than in some other examples; the forehead is low and receding, but by no means below the average; the maxilla large; and the malar bones broad and massive. The nasal bones are imperfect; but suffice to indicate a prominent nose, as is the prevailing character in other examples. The female head, though illustrating the general characteristics of female Huron skulls, is decidedly the largest and best formed of all those in Dr. Taché's collection. Unfortunately the fracture of the zygoma deprives it of one feature in which the greater delicacy of the female skull is apt to show itself most definitely. The superciliary ridge, as usual in the female, is wanting. The frontal region is well developed for an Indian; the occiput is little protruded; and the whole

contour, as seen in profile, shows a well-proportioned and symmetrical head. The measurements of the two skulls are Nos. 5 and 14 in the following table :

MEASUREMENTS OF HURON SKULLS.

No.	Sex.	L. D.	P. D.	F. D.	V. D.	I. M. A.	O. F. A.	H. C.
1	M	7.00	5.50	4.40	5.25	14.50	14.60	20.00
2	M	7.12	5.55	4.00	5.35	14.75	14.25	20.25
3	M	7.20	5.55	4.60	5.40	14.90	14.60	20.40
4	M	7.35	5.40	4.35	5.20	14.30	14.40	21.60
5	M	7.37	5.45	4.15	5.55	15.15	14.75	20.50
6	M	7.60	5.25	4.00	5.55	15.00	15.12	20.75
7	M	7.75	5.20	4.10	5.55	14.90	14.75	21.00
8	M	7.50	5.70	4.00	5.95	16.00	15.50	21.25
9	M	6.95	5.45	3.75	5.50	14.60	14.00	19.50
10	M	7.12	5.50	4.10	5.12	14.30	14.35	20.20
11	F	6.45	5.40	4.15	4.95	13.70	13.05	18.60
12	F	6.80	5.20	4.20	5.20	14.10	13.95	19.40
13	F	6.95	5.20	4.00	4.90	13.30	13.60	19.55
14	F	7.00	5.35	4.10	5.12	14.25	13.50	20.00
15	F	6.70	5.00	4.00	5.00	13.50	13.60	18.75
16	F	7.20	5.10	4.20	5.30	13.90	14.20	20.00
17	F	7.20	5.10	4.30	5.75	13.90	14.50	19.95
18	F	7.11	5.30	3.80	4.90	13.50	13.50	19.30
19	F	6.80	5.40	4.10	5.20	13.70	13.90	19.70
20	F	6.90	5.30	4.10	5.30	13.90	14.20	19.60
M. Mean		7.29	5.45	4.14	5.44	14.84	14.63	20.54
F. Mean		6.91	5.25	4.09	5.16	13.77	13.80	19.48
Total Mean...		7.10	5.34	4.12	5.30	14.31	14.22	20.01

The measurements in the above table, including ten male, and ten female Huron skulls, are derived from specimens in Dr. Taché's collection at Laval University, and from others, obtained by Dr. Thorburn from the same locality, and now in the Museum of the University of Toronto. Of those some are exceptional examples, to be presently described; but it will be seen, so far as all the evidence now supplied bears on the question, that the dolichocephalic character previously ascribed by me to the Huron head is fully borne out. The measurements of thirty-seven skulls from the Huron country, given in another

work,* were chiefly derived from male skulls: and the mean accordingly exceeds those of the present table. It is:

	L. D.	P. D.	F. D.	V. D.	I. M. A.	O. F. A.	H. C.
	7.39	5.44	4.31	5.43	14.66	14.65	20.49

Mr. Langton has also communicated to me the following mean results of the measurement of ten skulls in Dr. Taché's collection, seven of them male, but including some selected because of exceptional specialties:

	L. D.	P. D.	F. D.	V. D.	I. M. A.	O. F. A.	H. C.
M.....	7.34	5.38	3.75	5.51	14.96	14.67	20.46
F	6.72	5.16	3.58	5.06	13.83	13.48	19.02

The only doubtful element of comparison in the latter is the frontal diameter. In my own measurements it is taken from the point of junction of the frontal, parietal, and malar bones. If taken at any point anterior to this the breadth diminishes. But with due allowance for the relative numbers of male and female skulls, the results as a whole do not conflict. The larger the number of examples employed, there is of course the greater likelihood of eliminating exceptional elements.

Mere averages, however, are at all times of very partial value; and especially so when derived from a group including exceptional examples, or marked deviations from the prevailing type. But, with the aid of my friend, the Rev. James Douglas, I have obtained photographic views of some of the most remarkable skulls in the Laval Museum; and by their means I am able to present in more definite detail some of the fruits of Dr. Taché's indefatigable labours. From crania purposely recovered because of noticeable deviations from the prevailing type, Nos. 6 and 7 of the above table have been selected to exhibit them in their most characteristic aspects. No. 6 is shown in its four principal views, on Plate II. It is unfortunately imperfect, as seen in front, but not to such an extent as to interfere in any material degree with the exhibition of its chief specialties. As will be seen at a glance, it deviates greatly from all predominant Indian head forms, especially when viewed from above. It is also noticeable that in this example the superciliary ridges are scarcely more marked than in the ordinary female skull; though the bones of the face are otherwise large, promi-

* Prehistoric Man, 2nd. ed. p. 468.

nent, and of the ordinary Indian character. The chief peculiarities noticeable in No. 6,—with the exception of the absence of the superciliary ridges,—appear in another example of the same long type of Huron skull, No. 7, figured on Plate III. As shown when viewed from behind, both skulls are of unusual breadth at the base, and between the temporal bones; the mastoid processes are large; and in profile the outline of the forehead, especially in No. 7, is markedly receding.

But the specialties for which these skulls invite attention now, are chiefly shown in the vertical views. No. 6 presents in this aspect a long symmetrical oval, in which the outline of the occiput differs very partially from that of the frontal bone. In No. 7, as will be seen from the table of measurements, the extreme length, as compared with the breadth, is still more remarkable; but the view is taken so as to show more of the forehead; and the protuberant character of the occiput must be judged by the lateral view. The sutures in No. 7 are closed; and much both of the sagittal and lambdoidal suture is nearly obliterated by ossification. In neither example is there any trace of the prominent parietal protuberances, or posterior excess of breadth, with the narrowing towards the frontal region, which ordinarily constitute characteristic features of the Indian head, and are so manifest in the vertical view of the remarkable brachycephalic skull from a Huron ossuary shown on p. 126. So greatly indeed does this remarkable type deviate from the prevailing head-form, alike of the dolichocephalic and brachycephalic Indian skull, that were it not for the characteristic facial features, and the undoubted recovery of the skulls from a Huron ossuary, I should have been inclined to reject them as wrongly classed among Indian crania. A comparison with the normal male Huron skull, as shown on Plate I, and a reference to the contrast in relative breadth and length of No. 5 of the above table, in which its proportions are placed alongside of those of the other two, furnish means for judging of the differences between them.

On turning originally to the study of the Huron head-form, I was prepared to anticipate a prevailing uniformity of type, owing to seemingly favourable circumstances of isolation. But the comprehensive generalizations of earlier American ethnologists, under the guidance of Dr. Morton, which led to the doctrine of a homogeneous cranial type for the American aborigines, has every where failed when subjected to the crucial test of detailed observation. The idea even of a uniform

tribal head-form, it is apparent, must admit of perplexing aberrant deviations. Even among the Esquimaux,—isolated seemingly within their native arctic region, and, especially on the eastern side of the continent, cut off from all contact with the true Indian race,—although a markedly typical head-form prevails, examples occur which would puzzle the most experienced craniologist to assign to them any distinct ethnological affinity.

Such lines of transition from one to another and essentially distinct ethnical group, harmonize with the present tendencies of an all-comprehensive generalization in natural history. It is interesting indeed to revert to the views promulgated by one of the most distinguished among the naturalists of this continent at a comparatively recent date; and to compare them with the prevailing tone of scientific opinion at the present day. Professor Agassis, writing in 1853, in his "Provinces of the Animal Kingdom and their relation to Man," thus defines what then appeared to him to be the only alternatives presented to the student of the natural history of man: "Either mankind originated from a common stock, and all the different races with their peculiarities, in their present distribution, are to be ascribed to subsequent changes: an assumption for which there is no evidence whatever; ..... or what are called human races, down to their specialization as nations, are distinct primordial forms of the type of man." Since this alternative was promulgated, the scientific world has learned to treat such a dilemma as one of easy solution; in view of the comprehensive pedigree which aims at tracing all animal life, man included, to some common lowly-organized form. The line of reasoning thus pursued has, at any rate, gone far to put an end to the multiplication of races of men, constituting distinct species with no common origin. In man at least, the further minute research is extended, the intervals between seemingly primary typical forms diminish. There is no longer an assumed American man, as distinct from every type in the Eastern Hemisphere as the Catarhine Simiadæ of the Old World are from the Platyrhine group of New World monkeys. Wide apart as are such diverse types as those indicated in the primary divisions of Blumenbach, they are no longer isolated by impassable type-forms, but are found to merge in certain directions by slightly varying links, until—as in the Huron or the Esquimaux group,—we learn to recognise examples which defy the limits of typical classification; or even stand out in striking contrast to some of the most favoured characteristics of the race, with which, nevertheless, they appear to be correctly classified.

ON THE STABILITY OF FLOATING BODIES.

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The following direct method of determining the nature of the equilibrium of a floating body was devised by the writer in January, 1870. The particular case of the fluid being of constant density is taken; and the displacement is supposed to take place round a certain line in the plane of floatation.

Let Ox, Oy, Oz be axes fixed in space, and Ox', Oy', Oz' axes fixed in the body; ρ the density of the fluid, ρ' the density of the body; V the volume of the fluid displaced, V' the volume of the body; $\bar{x}$, $\bar{y}$, $\bar{z}$ the centre of gravity of the body, $\bar{x}'$, $\bar{y}'$, $\bar{z}'$ the centre of gravity of the fluid displaced; p, p' the pressures at a point of the element dS of the surface of the body before and after displacement, respectively.

Then, before displacement, for equilibrium we have

$$-g\rho' V'.\bar{x} + g\rho \iint z\,(xdx - ydy)\,dy = 0,$$

and $\rho V = \rho V'$,

$$\therefore \rho' V'\bar{x} = \rho V\bar{x}' = \rho \iint z\,(xdx - ydy)\,dy \quad \ldots\ldots\ldots (1)$$

After displacement through an angle $\delta\theta$ around Oy, x, y, z become $x + z\delta\theta$, y, $z - x\delta\theta$, respectively, and the sum of the moments of the fluid pressures about Oy

$$= -g\rho' V'(\bar{x} + \bar{z}\,\delta\theta) + g\rho \iint \{z\,(xdx - ydy)\,dy - \delta\theta\,(x^2dx - zxdz)\,dy\}$$

$$= -g\rho' V'\bar{z}\,\delta\theta - g\rho\,\delta\theta \iint (x^2dx - zxdz)\,dy, \quad \text{by (1)}$$

$$= g\rho\,\delta\theta \{-V\bar{z} - \iint x^2dxdy + \iint zxdzdy\}$$

$$= g\rho\delta\theta \{V(\bar{z}' - \bar{z}) - \iint x^2dxdy\}, \quad \ldots\ldots (2)$$

if Oy passes through the centre of gravity of the plane of floatation $\therefore V\bar{z}' = \iint zx\,dz\,dy$, by the properties of the centre of gravity; and equilibrium is stable or unstable according as (2) is negative or positive, *i. e.*, with the usual notation, according as $V.HG \gtrless Mk^2$.

NOTE.—In taking the moment of p' about Oy, p' is resolved into forces parallel to Ox', Oy', Oz'; so that the moment of $p'dS$, dS being projected on yz', $z'x'$, $x'y$, $= p'\,(xdxdy - zdzdy) = g\rho\,(z - xd\theta)\,(xdx - zdz)\,dy$.

November 12, 1870.

IDENTIFIED STATIONS ON THE SOUTHERN ROMAN BARRIER IN BRITAIN.

BY THE REV. JOHN McCAUL, LL.D.,

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In this article I propose giving an analysis of the epigraphic evidence collected in Horsley's *Britannia Romana*, Bruce's "Roman Wall"—3rd edition, and especially the *Lapidarium Septentrionale** (published by "the Society of Antiquaries of Newcastle-upon-Tyne)," for the identification of the first twelve stations named in the *Notitia* as the quarters of the troops that were posted *per lineam valli*. Previously to entering on particulars, it may be convenient to introduce a brief statement of the different answers that have been given to the question—"Who built the wall?" As to the upper barrier between the Forth and the Clyde there can be no doubt that it was constructed by order of Antoninus Pius, who is named on many stones that have been found along the line, whilst Lollius Urbicus was his legate, about A.D. 140; but the evidence regarding the origin of the Southern Wall—between the Tyne and the Solway—is much less satisfactory. The authority of ancient† authors has been regarded as divided between Hadrian and

* This work will be completed in three parts, of which the first two have been published. They will form a remarkably handsome folio volume, distinguished by the number, accuracy and finish of its illustrations, whilst its intrinsic merits are such that no collection of books on British Archæology can be complete without it. The *Lapidarium Septentrionale* is cited in this paper as L. S.

† There is no ancient author but Spartian (a writer at the close of the third century) who states that Hadrian was the builder of the wall; and he is inconsistent in his statements, for in another passage he distinctly ascribes the construction to Severus. The words τεῖχος and διατείχισμα, used by Dio Cassius, do not necessarily imply a stone wall. The first term refers more probably to the northern barrier, which was certainly not of stone; and even if the latter be regarded as meaning a stone wall, the inference might be that this structure was erected by the order of Severus before he came to the island in 208, an inference, which is consistent with the date, 207, on the quarry near the Gelt. In an inscription found at Kirkandrews, "about a mile south of the wall," the southern barrier is called *Vallum*. Mr. Thomas Hodgson (cited by Dr. Bruce, Roman Wall, 3rd edition, p. 298), says of the altar bearing this inscription:—"If any inscription can from the shape of the letters, and the simple character of it, be claimed as one of an early date, it is this one. It, to my mind, has

Severus, but the evidence of almost all, including Julius Capitolinus, Eusebius, Aurelius Victor, Eutropius, and Cassiodorus, is in favor of the latter, whilst most mediæval writers, beginning with Gildas, ascribe the building of the wall to a Roman legion that was sent back to the island about the middle of the fifth century. Horsley, the author of the *Britannia Romana*, "thought that most of the stations of the wall were built by Agricola. He considered that the north agger of the Vallum was also the work of that general, and that it was the military way by which his garrisons held communication with each other. The fosse of the Vallum and its southern ramparts he ascribed to Hadrian, whom he represents as taking for his military way the previously existing north agger—the military way of Agricola. The stone wall, with its ditch, mile-towers, and turrets, he considered to be the work of Severus." The Rev. John Hodgson, "the historian of Northumberland," formed a different opinion. He says: "In the progress of the preceding investigations I have gradually and slowly come to the conviction that the whole barrier between the Tyne and the Solway, and consisting of the Vallum and the Murus, with all the castella and towers of the latter, and many of the stations on their line, were planned and executed by Hadrian; and I have endeavoured to show that in this whole there is unity of design, and a fitness for the general purposes for which it was intended, which I think would not have been accomplished if part of the Vallum had been done by Agricola, the rest of it by Hadrian, and the Murus, with its castella, towers, and military way, by Severus." This theory is ably and enthusiastically advocated by Dr. Bruce. In the years 1852-1854, through the munificence of Algernon, fourth Duke of Northumberland, a minute survey of the whole line was made by Mr. Henry MacLauchlan. The conclusions, on the *quæstio vexata*, at which he arrived "coincide in a great measure with those of Horsley." "It seems probable," he remarks, "that the Stations were made by Agricola, and walled at some subsequent period." "It is probable that the Vallum was made by Hadrian, at all events before the wall. The wall and castles may have been made or designed at the same time, after the walling of the

every appearance of being erected in the reign of Hadrian." Both these characteristics, especially the former, are fallacious criteria. In Hadrian's diploma, unquestionably of the date A.D. 124, the lettering is so bad, that I doubt not that, if the elements of the date had been obliterated, some of those who undertake to determine the age of an inscription from the form of the letters, would have placed it two or three centuries later than it really is.

Stations; commenced, perhaps, by Severus, and finished, or repaired by his successors."

Mr. Merivale, the author of "the History of the Romans under the Empire," and other works characterized by learning and judgment, takes nearly the same view as Gildas. His opinion is stated in an article in the *Quarterly Review*, vol. cvii, published of course in that periodical without a name, but referred to and acknowledged by the author in his "History of the Romans under the Empire," vol. vii, p. 436. In the following extract from the article, Mr. Merivale's opinion is briefly expressed:—"Early in the fourth century the island was overrun by the barbarians of Caledonia, whom we now first hear of under the name of Picts and Scots, and their predatory hordes were encountered by Theodosius, the general of the Emperor Valens, in the neighbourhood of London, in the year 368. The invaders were routed and driven back beyond both the limitary ramparts, and Theodosius restored, as we are expressly informed by a respectable historian, the camps, castles, and *prætenturæ*, or chains of forts in the north, and reconstituted the province beyond the Solway under the designation of Valentia. As, however, no prudent general could hope to retain the permanent occupation of this exposed district, it might be judged expedient to take this opportunity of securing the lower and more important line of defences by the strongest fortifications. If, hitherto, the bulwarks of the Lower Isthmus had been confined to the camps and mounds of Hadrian and Severus, it was now, we may suppose, that the stations were fenced with masonry, and the wall designated, and at least partly executed, with broad openings at every mile for the temporary shelter of the exposed provincials beyond it. After the retirement of Theodosius, the frontiers were again assailed by the restless savages. Stilicho, about 400, issued orders from Gaul for putting the island in a state of defence against the Saxons, the Picts, and the Scots, and, if we may rely on the evidence of the poet Claudian, his designs were carried fully into execution. We may at least admit that his engineers continued and extended the plan of Theodosius. Finally, after the withdrawal of the Roman garrison by Maximus, the Picts and Scots repeated their attacks, and the single legion which was sent from Rome in 414, and again a few years later, may have assisted or at least advised the natives in putting the finishing stroke to their defensive works, and thus the wall, the remains of which we now see, may have occupied, from first to last, fifty years in building."

The paucity of remains of the latter part of the fourth century, and the total absence of inscriptions and coins after the first decade of the fifth, including any evidence of Christianity in the period, strongly militate against this theory, that gains but little support from such authorities as Claudian or Gildas. I incline to Horsley's inferences, as modified by Mr. MacLauchlan, and think it very probable that the wall and works were repaired and altered in the times of Theodosius and Stilicho.

Turning from this question, regarding which (as I have never seen the remains and have no personal knowledge of the locality) I cannot but feel—*non nostrum—tantas componere lites*, I shall merely add to these prefatory remarks, with a view to the clearer apprehension of the statements in the subjoined analysis, that, in addition to a few incidental notices in classical authors, the authorities for the troops in Britain during the Roman occupation of the island are—**Notitia Dignitatum et Administrationum omnium tam civilium quam militarium in partibus Orientis et Occidentis;* three *Tabulæ Honestæ Missionis* found in the island, *viz.*, Trajan's of A.D. 104, Trajan's of A.D. 106, and Hadrian's of A.D. 124; and other inscriptions, chiefly British; whilst the authorities for geographical items are †*Ptolemæi Geographia*, ‡ *Antonini Itinerarium*, and || *Anonymus Ravennas*.

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* The date of this work is uncertain. Panciroli was of opinion that it was written at the close of the reign of Theodosius Junior, *i. e.* about the middle of the fifth century. This opinion is rejected as evidently erroneous, by Böcking. Gibbon was of opinion that it was composed between the division of the empire, A.D. 395, and the successful invasion of Gaul by the barbarians, A.D. 407. Guizot refers it to the time of the Emperor Theodosius I. that is, in the fifth century, when the empire was already divided into Eastern and Western. Mr. Hodgson Hinde, History of Northumberland, vol. 1, pp. 18-19, suggests reasons for inferring that "the *Notitia* was compiled in or about the year 403, the date of the battle of Pollentia." I have strong doubts that all the statements in it are records of the same year, and suspect that the original has in some places been modified. We may however, I think, safely assume that its notices do not extend lower than about the beginning of the second decade of the fifth century.

There is an able article on the Roman army in Britain, by Hübner, in the Rheinische Museum für Philologie, n. 1, 1856.

† Flourished A.D. 150.

‡ The date of this work, also, is uncertain. The Antoninus after whom it is called has been regarded as Marcus Aurelius, but there is reason to believe that this road-book of the Roman Dominions was commenced by order of Julius Cæsar, and completed in the reign of Augustus. The copy of it, that we at present

Accurate copies of the three *Tabulæ Honestæ Missionis* are printed in the *Lapidarium Septentrionale*, a work, which the present Duke of Northumberland has further enriched by the very valuable contribution of exact facsimiles of those diplomas, executed under the supervision of Mr. A. W. Franks. The geographical authorities may be conveniently consulted in *Monumenta Historica Britannica*, and Horsley's *Britannia Romana*.

§ 1. SEGEDUNUM=Wallsend.

"*Tribunus cohortis quartæ Lingonum Segeduno.*" NOTITIA.

The only legible inscriptions found at Wallsend mention the *Legio secunda Augusta* (LEG· II· AVG·) and some centuries of different cohorts. At *Tynemouth, however, *Cohors quarta Lingonum* (COH· IIII· LINGONVM) is named, and on another stone the *Legio sexta Victrix* (LEG. VI· VI·) No date can be derived from any of the inscriptions; but we † know from Trajan's diploma of the date A.D.

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possess, seems (like the *Notitia*) to have been modified, and the designation *Antonini Itinerarium* points to the time of the Antonines (*M. Aurelius* and *Antoninus Pius*) at which these modifications seem to have been made. Its date has been fixed by some, but on insufficient grounds, at about A.D. 320.

‖ Believed to have flourished in the seventh century.

* At the mouth of the Tyne in the bed of the river a remarkable relic of the Roman period was found—the boss (*umbo*) of a shield, that belonged, as we learn from an inscription on it, to a soldier of the 8th Legion, *Junius Dubitatus* of the century, probably, of *Julius Magnus*. An excellent engraving of it has been contributed by the owner, the Rev. Wm. Greenwell of Durham, to the *Lapidarium Septentrionale*, p. 58, and the subject is there fully discussed. Dr. Bruce remarks: "The eighth legion was never in Britain. The owner of the shield must therefore have been an occasional visitor; or, perchance, he may have approached our shores with the view of taking the command of some auxiliary cohort."

There is certainly no evidence that the eighth legion was ever in the island, but we know from Henzen's, n. 5456, that vexillations of that legion (*Augusta*), of the seventh (*Gemina*), and of the twenty-second (*Primigenia*), each a thousand strong, took part in Hadrian's expedition. These bodies were, I suspect, employed on the barrier. I have but little doubt that Junius Dubitatus, named on this boss, was a soldier of the vexillation of the eighth that is mentioned in that inscription. He seems to have been drowned, probably with some comrades, the boat or vessel in which he was having been upset or swamped whilst crossing or entering the river.

† On the inner side of the diploma we have the numeral IIII, but on the outer III. As we know from the *Notitia*, and from an inscription found in the island, that the fourth cohort was in Britain, the latter numeral is commonly regarded

106, that the *Cohors quarta Lingonum* was in the island at that date.

§ 2. PONS ÆLII=Newcastle.

"*Tribunus cohortis quartæ Cornoviorum Ponte Ælii.*" NOTITIA.

The only *corps* named on a stone found here is *Cohors prima Thracum* (COH· I· THRACVM·)

This cohort is named on two stones found at Bowes, in Richmondshire; one of the date A.D. 196 or 197, when Virius Lupus was Legate of Severus; the other, probably, of the time of Constantine. Four *Cohortes primæ Thracum* are distinguished. *Cohors prima Thracum, Cohors prima miliaria Thracum, Cohors prima Thracum C. R.* (of which the first two are placed in Arabia, and the third in Pannonia by the *Notitia*), and the *Cohors prima Thracum equitata* that was in Pannonia in A.D. 154. In Marini's Atti de' fratelli Arvali there is mention in an inscription, found at Rome, of *Claudius Paulus Præfectus cohortis primæ Thracum in Britann.*

Only three other inscriptions are ascribed to this station, one of which probably gives the names of two soldiers of a century.

No date can be derived from any of the inscriptions.

§ 3. CONDERCUM=Benwell.

"*Præfectus alæ primæ Asturum Conderco.*" NOTITIA.

The *Ala prima Asturum* (* ALA PRI HISPANORVM ASTVRVM, ALA I ASTORVM or ASTVRVM) is named on three inscriptions that have been found here. The date of one (L. S. n. 22) is between A.D. 238–244 (the period in which Gordian was emperor), of †another (L. S. n. 27)

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as having been cut by mistake. See however Gazzera, "Notizie di Dipl. Imp. p. 40, n. 4, Cardinali, Dipl. Imp. p. 148, and Henzen, Jahrbb. des Vereins v. Alterth.—Frounden im Rheinl. xiii, p. 92.

* In the Spanish cavalry regiments, the term *Hispani* sometimes, as here, precedes the names of the tribes or peoples: thus *Ala I Hispanorum Vettonum.* Such *alæ primæ* are not to be confused with the *Ala I Hispanorum.* Similarly the *Ala II Asturum* stationed at *Cilurnum* was different from *Ala II Hispanorum,* of which there must have been two, as we find this *ala* placed in the *Notitia* both in the Thebaid and in Arabia, or else these notices refer to different times.

† Dr. Bruce, L. S. p. 25, remarks: "This slab refers to a plurality of emperors, and belongs, according to present appearances, to the reign of Severus and his sons, A.D. 198–211. The inscription is, however, in so imperfect a state, that confidence cannot be placed on any reading of it." According to the text, as given by Horsley, *Brit. Rom.*, North., ix, the victory named in it is of two Augusti, and Alfenius Senecio is mentioned as Consularis, from which it may be inferred that the "victory" refers to the expedition of Severus and Caracalla

A.D. 208 or the beginning of 209, and of the third * doubtful. Two Legions, also, are named on other stones found here, *viz. Legio Secunda Augusta* (LEG· II· AVG·) in the time of Antoninus Pius, and *Legio Vicesima Valeria Victrix* (LEG· XX· V· V·) Of the †latter the

against the Caledonians, and that the date is before Geta was made Augustus in 209, and not earlier than 208, the year in which Severus and his sons came to Britain.

* This inscription is sadly mutilated. According to Mr. Mossman's reading as given in the wood cut, the extant letters are—

NIO
BI AV
I SV
AVG E
LÆIAS
OI I
V
I

Dr. Bruce, reading P for B, expands — [*Imp. Cæs. M. Anto*] nio [Gordiano] Pi [*o Felici*] Au [*g*] . . . . Aug . . . . [*A*] læ I As [*turum*] . . . oi . . . . The second AVG may have been applied to an Imperial Legate *scil.* LEG· AVG·, whose name has been lost; but if we refer it to a joint Emperor, and adopt Mr. Mossman's reading BI, it would seem that we have here the two Galli—*C. Vibius Trebonianus Gallus* and *C. Vibius Afinius Gallus Voldumnianus Volusianus.* On this supposition, the date will be between A.D. 252–254.

† This inscription is on an altar erected by Tineius Longus, who may have been *Præfectus Alæ primæ Asturum* and *Tribunus Laticlavius Legionis Vicesimæ.* In it we have the words—*judiciis optimorum maximorumque Impp. N. sub. Vlpio Marcello Cos,* from which it is difficult to derive an exact date. In treating the question it may, in my judgment, be assumed as certain, that the *Ulpius Marcellus Consularis* named here, was the Governor and General who drove back the insurgent Caledonians in A.D. 184; and as most probable, that the *Imperatores Nostri* were joint emperors, the "AUGUSTOR'," in another inscription found along with this. The point of the difficulty then, is—that the inscription represents *Ulpius Marcellus* as *Consularis* in the island in the time of joint Emperors, whilst Xiphiline, in his abridgment of Dio Cassius, states that it was Commodus who sent him against the Caledonians, and we know that he obtained the title *Britannicus* in A.D. 184, from the success of that General in the island. The following seem to be the only solutions that can be offered. The orders for the promotion of Tineius Longus may have been given by Aurelius and Commodus, but not carried out until some years afterwards—*sub Ulpio Marcello Consulari*—sent by Commodus to the island in 184. Or (according to my supposition, as stated in the Canadian Journal) Ulpius Marcellus may have been sent during the joint reigns of Aurelius and Commodus to Britain, where he continued in

date is probably between A.D. 180 and 184. In an * imperfect inscription (L. S. n. 29) I find the *Cohors prima Vangionum* (COH· I· VANGIONVM).

From Hadrian's diploma of A.D. 124, we know that the *ala prima Hispanorum Asturum*, and, probably, the *Cohors prima Vangionum*, were in the island at that date. The latter *corps* (with the addition *milliaria*) was there in A.D. 106, as we learn from Trajan's diploma of that date. In L. S. n. 18. DEO M || ARTI V || ICTOR || VINDI || V, expanded by Dr. Bruce—"Deo Marti Victori Vindi [cianus] ? votum [solvit]"—we have, perhaps, a trace of the Asturians, for VINDI in the fourth line = VINDIO seems to be an epithet of Mars derived from the mountain *Vindius*, in Spain, that separated the Astures and the Cantabri.

§ 4. VINDOBALA=Rutchester.

"*Tribunus Cohortis Primæ Frixagorum Vindobala.*" NOTITIA.

For *Frixagorum* we should most probably read *Frisiavonum*, as this cohort (*Cohors prima Frisiavonum*) was in the island in A.D. 106 and 124, as we learn from Trajan's and Hadrian's diplomas of those dates respectively. No inscription has been found at this place in

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office up to the time of the outbreak, and was then sent by Commodus, at the time reigning alone, not from the Continent, but from the part of the island where he then was, to the North, to repel the insurgents who had crossed the barrier. These suppositions may be modified by the hypothesis that the orders for the promotion were given in A.D. 180, before March the 17th, the day on which Aurelius died, and that afterwards, in the same year, Ulpius Marcellus was sent by Commodus to Britain, where he continued in office up to the time of the outbreak, and was then dispatched to the North, from the part of the island where he at the time was. Or, finally, Xiphiline may in mistake have ascribed to Commodus alone what was done in the time of both Emperors. Of these the second hypothesis, as modified, seems to me the most probable.

* I restore the inscription thus:

[COH· I· VAN]GIO
[NVM· CVIP]RÆ· EST
[MAE]C· CASSI
[ANVS· PR]ÆF
[V· S· L·] M

There were, probably, more letters than I have given before C· CASSI in the third line, and ÆF in the fourth. The point after PRÆ in PRÆEST is found in other inscriptions *e. gr.* in one of those lately discovered at Maryport, for copies of which I am indebted to Dr. Bruce.

which either *Frixagi* or * *Frisiavones* are named. There are memo-

* It has lately been ascertained from examination of the original *tabulæ*, that it was a cohort of this people—*Frisiavonum*, not *Frisianonum*, nor *Frisianorum* —that served in Britain in A.D. 106, according to Trajan's diploma of that date, and in 124, according to Hadrian's. This cohort seems to be named in two inscriptions found at Manchester:—

(1) COHO· I· FRISIAV ‖ Ↄ MASAVONIS ‖ P XXIII, and
(2) COHR I FRISIAVO ‖ ? OVI ? ? ? ‖ ? P XXIIII·

In (1) FRISIAV is the correct reading, not FRISIN, as given by me in Brit. Rom. Inscrip. on Horsley's authority. The second line in (2) is read by Dr. Bruce, L. S. p. 6, YOVIANVM, which yields no meaning. It has been suggested to me by Mr. Thompson Watkin, of Birkenhead, England, that this line may have contained the centurial mark and some such name as *Ioviani*. Can the word have been a contracted form of IOVIANORVM (from Diocletian) or BOVIANORVM (from *Bovium* in Britain)? In the third line, the character before P XXIII seems to have been P, which may stand for *Per* or *Pedatura*.

In an inscription found at Papcastle, in 1865, we have the form FRISIONVM. It appears uncertain whether the *Frisii*, *Frisei*, *Frisœi*, *Frisiai*, *Frisiones*, *Frisiavones*, *Frisiabones*, and *Frisœvones*, should be regarded as the same people. The last three may be regarded as different forms of the name of one tribe, even though Pliny places the *Frisiabones* (or *Frisiavones*) in one passage, iv, 29, in the islands at the mouth of the Rhine, and in another, iv, 31, in northern Gallia, between the *Sunuci* (or *Suniĉi*) and the *Bœtasii* (or *Betasii*).

I expand P XXIIII *Pedes quatuor et viginti* as in similar inscriptions. See Brit. Rom. Inscrip. pp. 117, 118. Dr. Bruce (L. S. p. 37) offers the following objections to my view that such centurial stones were intended to mark the space set apart for quarters in an encampment: "If centurial stones were peculiar to the stations this theory might be entertained, but they occur at intervals along the whole line of the wall. In very many instances they are found in places where there are no traces of encampments. What in such cases are we to make of them?" As my view was that such stones marked the boundaries of the quarters, not merely in *castra stativa*, but in temporary encampments, formed as the troops were moved from place to place to work on the barrier, I should expect to find them "at intervals along the whole line of wall." To the other objection the obvious answer is—that the stones remained, but other traces of the encampment were obliterated. "The occurrence of more than two stones with the same inscription, in one locality, is consistent," as Dr. Bruce remarks, "with this view, as four would be required to mark the ground appropriated." Add to this that only two would be required to mark the limits of work done, as we find tablets in pairs on the wall of Antoninus, that we sometimes have on these stones not only the name of the centurion, but also his rank *e. gr. Hastatus primus*, and *Princeps posterior*, (see Brit. Rom. Inscrip. p. 120, and L. S. n. 127, and compare L. S. nn. 140 & 51), and that there is not one certain instance amidst the numerous examples of centurial stones of the use of

rials, however, of LEG· II· AVG· and LEG. VI. V., and we derive the date A.D. 213 from an inscription mentioning *C. Julius Marcus* as Legate of *Caracalla—*Trib. Pot. xvi. Cos. iiii. Imp. ii.*

§ 5. HUNNUM=Halton Chesters.

Præfectus Alæ Sabinianæ Hunno. NOTITIA.

This *ala* is named on one stone found here. We have, also, memorials of LEG· II· AVG·, LEG· VI· V· P· F·, and LEG· XX· VV· The only date that we can derive is A.D. 158, from a stone in which the *Legio sexta Victrix Pia Fidelis* is mentioned with the addition—TER· ET· SAC· COS=*Tertullo et Sacerdote Consulibus.*

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fecit or *posuit.* As I have adverted to centuries, I may add that we cannot refer all such stones to legionary troops. The auxiliary cohorts were similarly divided (see n. (1) above in this note), and the centurions seem to have had similar designations, *e. gr. princeps* in the second cohort of Tungrians. (See Brit. Rom. Inscrip. pp. 13, 17.) Dr. Bruce, L. S. p. 196, remarks that "As the names of the commanders in inscriptions are usually Roman, we may further conclude that the auxiliary forces were generally officered by native Italians." Influenced by this view, he explains the passage in Tacitus, Hist. iv, 12, relative to the Batavians:—"Mox aucta per Britanniam gloria, tranmissis illuc cohortibus, quas vetere instituto nobilissimi popularium regebant," as special. "Had this not been a somewhat peculiar case," he remarks, "it would not have been so distinctly mentioned." In this explanation, the words "vetere instituto" seem to have been overlooked; and the Roman forms of the names of the commanders, noticed by Dr. Bruce, merely show that those persons were Romanized provincials, probably, most of them *cives Romani.* Of the commanders of auxiliary troops in Britain, whose birthplaces are stated, we have, I think, but one native Italian, viz., Quintus Petronius Urbicus, Præfect of the fourth cohort of Galli, from Brixia in Italy. Titus Domitius Heron, Præfect of the second cohort of Galli, was from Nicomedia in Bithynia. Æmilius Crispinus, Præfect of the *ala Augusta,* was from Tusdrus in Africa. Publius Ælius Magnus, another Præfect of the same *ala,* was from Mursa in Pannonia. Marcus Antonius Cornelianus, Præfect of the first cohort of Spaniards, was from Nemausus in Gallia Narbonensis, and Lucius Antistius Lupus Verianus, another Præfect of the same cohort, was from Sicca in Africa. It is remarkable that in examples of this kind, *viz.,* in which the birthplaces of the commanders of auxiliary troops are stated, their birthplaces almost always indicate that the commanders were not of the same nationality as that which gave name to the corps. Perhaps it was customary only in such cases to state the birthplaces. As to the men it can readily be proved that they were often of nationalities different from that of the corps to which they belonged. (See Brit. Rom. Inscrip. p. 245.)

* I give the form of this nick-name that has been generally adopted: the ancient authority, however, favors *Caracallus.*

§ 6. CILURNUM=Chesters.

Præfectus Alæ Secundæ Asturum. NOTITIA.

This *ala* is named on two stones found here. We have, also, memorials of *Ælius Longinus* and *Manius Suilius Victor*, who certainly were in the cavalry, and very probably were, respectively, *Præfectus* and *Eques* of this *ala*. A legion, perhaps LEG· II· AVG·, is mentioned in an inscription of A.D. 138. The *Cohors prima Vangionum* is distinctly read on a grave-stone, and I find **Cohors prima Cugernorum*, possibly, in L.S. n. 139, and †*ala Sabiniana*, possibly, in n. 146.

The dates of the *ala II Asturum* are A.D. 221, and, ‡perhaps, A.D 237, and if VLPIO in n. 124 refers to *Ulpius Marcellus*, the Legate of Commodus, we get a year, about 184. The *Cohors prima Vangionum* was in Britain, as I have mentioned in §3, in A.D. 106 and 124, and the *Cohors prima Cugernorum* was there in A.D. 104 and 124, as it is named in Trajan's and Hadrian's diplomas of those dates respectively, and also between A.D. 140–144, as we learn from an inscription found in Scotland on the wall of Antoninus. (See Brit. Rom. Inscrip. p. 233, note.)

§ 7. PROCOLITIA=Carrawburgh.

Tribunus Cohortis primæ Batavorum Procolitia. NOTITIA.

The *cohors prima Batavorum* is named on two stones found at this place, where we have also memorials of vexillations of the LEG· II·

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* The extant letters are CVGI = possibly CVGERN.

† The extant letters are VLPI . . . . .
SABIN . . . .

Dr. Bruce asks, "Can it have reference to Ulpius Marcellus, the legate of Commodus?" It is not improbable that he was the person who is named, and as there must have been stables here (for the *Ala II Asturum*) I suggest that the SABIN may have been part of SABINIANA, the name of the *ala* placed in the Notitia at *Hunnum*, but which may at some other time have been quartered here. It is remarkable that we have two *alæ* in successive stations.

‡ In L.S. n. 116, we have the inscription treated by me in Brit. Rom. Inscrip. p. 164, and Canadian Journal, xii, p. 109. Dr. Bruce reads it—"*D. M. Aventino Curatori Alæ II. Astur. Stip. XV. Æliomenus Dec. Her. pos.* . . . " The only doubtful points are the names of the *Curator*, the *Decurio*, and the Consul (*cos*). I suggest (according to Mr. Mossman's reading, as given in the woodcut) for the first AVR· NOTHENO (or NOTHINO) = *Aurelio Notheno*, or *Nothino*; for the second—ÆL· IOMENVS (or IOMINVS) = *Ælius Iomenus* or *Iominus* (whence the modern name "Jomini"); and for the third—PERPET (or PERPETV) = *Perpetuo*, the Consul of A.D. 237, who is named alone in L. S. nn. 354 & 378.

AVG·, LEG· VI· V· P· FIDELIS, and of LEG· XX· VAL· VIC, and of the *cohors prima Aquitanorum* (COH. I. AQVIT·)

The date of one of the inscriptions in which the first cohort of Batavians is named is A.D. 237, and of that mentioning the first cohort of Aquitanians about A.D. 124. Both these cohorts were in Britain in A.D. 124, as appears from Hadrian's diploma of that date. From the *Agricola* of Tacitus, we learn that there were three cohorts of Batavians in the island in A.D. 84.

§ 8. BORCOVICUS=Housesteads.

Tribunus Cohortis Primæ Tungrorum Borcovicio. NOTITIA.

The *cohors prima Tungrorum* is named on seven stones found at this place, and with the addition MIL. for *Milliaria* on two more.

We have also memorials here of LEG· II· AVG·, LEG· VI· V· P· F·, and of a * cohort of Pannonians. The only dates that we can derive from the inscriptions that were found here are—about A.D. 124 for the Second Legion, A.D. 252, and a doubtful one, but between A.D. 161–212. From the *Agricola* of Tacitus we learn that there were two cohorts of Tungrians in the island in A.D. 84.

§ 9. VINDOLANA=Chesterholm.

Tribunus Cohortis quartæ Gallorum Vindolana. NOTITIA.

The *cohors quarta Gallorum* is named on three stones found at this place. We have also memorials of LEG· VI· VIC·, LEG· II· AVG, and LEG· XX· VV, and of *cohors secunda Nerviorum* (COH· II· NER·) and, perhaps, *cohors tertia Nerviorum*. In n. 258 there is, probably, a trace of a Pannonian cohort. We can derive no precise date from any of the inscriptions, but one n. 244, in which *Severianæ Alexandrianæ* seem to have been erased, may thus be placed after A.D. 235, and another n. 261 was probably of the fourth century. (See Brit. Rom. Inscrip. p. 141.)

* It is certain that there was a cohort of Pannonians in Britain in A.D. 106, as it is named in Trajan's diploma of that date. From its position in that record it may be inferred that the numeral missing there was II = *secunda*, and this cohort is named in an inscription found at Malbray in Cumberland, but we learn from Mommsen's *Inscrip. Neapol.* n. 5024, that the first cohort of Pannonians was in Britain under the command of P. Septimius Paterculus, and as he was *Flamen Divi Trajani*, he may have commanded this cohort in the island in 106. In the *Notitia* a *cohors prima Augusta Pannoniorum* is stationed in Egypt.

§ 10. ÆSICA=Great Chesters.

Tribunus Cohortis primæ Asturum Æsica. NOTITIA.

No record has been found here of *cohors prima Asturum*, but in two inscriptions *cohors secunda Asturum* (COH· II· ASTVRVM) is named, whence it has been inferred that "some transcriber [of the *Notitia*] has in error written one numeral for the other." It may be objected to this inference, that the *cohors secunda Asturum* is placed in the eastern portion of the *Notitia* at Busiris in Egypt. This objection, however, does not seem to be valid, for we have in the same work the *cohors secunda Thracum* placed at *Gabrosentum* in Britain, and at *Musæ* in Egypt. The obvious solution appears to be in this, as in other similar cases, that there were two *cohortes secundæ Asturum* and two *cohortes secundæ Thracum*. The other military bodies named on stones found here are *cohors sexta Nerviorum* (COH· VI· NERVIORVM) and **cohors prima Rætorum* (COH· I· RAETORVM). From the latter we get the date A.D. 166–169, and one of the inscriptions in which *cohors secunda Asturum* is named yields A.D. 225. The second cohort of Asturians was in the island in A.D. 106 and 124, as appears from Trajan's and Hadrian's diplomas of those dates respectively. In the latter of these records the sixth cohort of Nervians is named, and we know from an inscription found at Brough, in Yorkshire, that it was there about A.D. 208. In the *Notitia* its quarters were not here but at *Virosidum*, the 23rd and last station mentioned in the list.

§ 11. MAGNA=Carvoran.

"*Tribunus Cohortis Secundæ Dalmatarum Magnis.*" NOTITIA.

The *cohors secunda Delmatarum* or *Dalmatarum* is †named in one inscription found near this place. We have memorials here also of LEG· II· AVG·, LEG· VI, and LEG· XX· V· V·, and of *cohors prima*

* There is no other evidence that this cohort was in Britain. In the *Notitia*, the *cohors prima Herculea Rætorum* is placed at Parrodunum in Rætia.

† There is a faint trace of them in the sepulchral inscription (L. S. n. 321) to a woman, who was a native of Salonæ in Dalmatia. Her name has hitherto been read AVRE· FAIAE = *Aureliæ Faiæ*, but Hübner has suggested the pretty emendation — AVR· ITALAE = *Aureliæ Italæ*, and this has been adopted by Dr. Bruce. Some years ago when I first saw the inscription I attempted to emend the name, but was deterred from tampering with it by the fact that F is distinct. Subsequently I accepted it, as I found in Dr. Bruce's 3rd edition of the Roman Wall, p. 345, what seemed to be the same name, *i. e.* AR (for A & V tied, followed by R) = AVR· FAIA.

Hamiorum Sagittariorum * (COH· Ī· HAMIORVM SAGITTAR·) and *cohors prima Batavorum* (COH. Ī. BATAVORVM). From the inscriptions in which the first cohort of Hamians is named we derive the dates A.D. 136–137, and about A.D. 163. On an altar (n. 295) we find the date A.D. 258, and an inscription to Constantine as Cæsar gives the period 306–308. The *cohors prima Hamiorum Sagittariorum* was in the island in A.D. 124, as we learn from Hadrian's diploma of this date. In the same record the first cohort of Dalmatians (of which there are memorials at Maryport) is named, and in both diplomas of Trajan—A.D. 104 and 106—the fourth cohort of Dalmatians is mentioned as being in those years in Britain. On the first cohort of Batavians see § 7.

§ 12. AMBOGLANNA=Birdoswald.

Tribunus Cohortis Primæ Ælicæ Dacorum Amboglanna. NOTITIA.

This station is in Cumberland; the preceding eleven are in Northumberland. The *cohors prima Ælia Dacorum* is named in †twenty-two inscriptions found at Birdoswald. We have memorials here also of LEG· II· AVG·, LEG· VI· VIC· PIA· FIDELIS, VEXILLATIO LEG· VI· VIC·, and LEG· XX· VV, and (in the neighbourhood) of the *Ala Petriana* (AL PET). From the inscriptions in which the first Ælian Cohort of Dacians is named we derive the dates about ‡A.D. 212

* In the Canadian Journal for April, 1869, I remarked: "As I have adverted to the *cohors Hamiorum*, known only from British inscriptions, I may mention that I have but little doubt that it was named in Hadrian's diploma of 124. The letters are Ī· M· SALIN. I would supply HA as the missing letters. On the meaning of SALIN I can offer no feasible conjecture, but it has occurred to me that it may possibly be a misreading of SAGIT *i. e. Sagittariorum.*" This suggestion—Ī· HAM· SAGIT· (which I regarded as uncertain, from doubt that that any one could have read SAGIT as SALIN) — is now known to be nearly correct, for Mr. Franks, on examination of the original plate in the British Museum, independently ascertained that the true reading was—Ī· HAMIOR· SAGITT *i. e. I. Hamiorum Sagittariorum.* (See L. S. p. 7.)

† There also seems to be a trace of them in L. S. n. 382, where we find the letters DECIBA that may be the beginning of the Dacian name—*Decebalus.*

‡ In this inscription *Modius Julius* is named as *Legatus Augusti Pro Prætore.* He is also mentioned in a "very roughly" cut inscription found at Netherby, the date of which may be ascertained from the first two lines. Dr. Bruce (Rom. Wall, 3rd ed. p. 400) reads—

IMP [ERATORI] [CAES. M. AVR.] (?) ANTONI [NO]
P. F. AVG. (?) BIS COS. VEXIL.

(L. S. n. 389), 237 (L. S. n. 354), 238–244 (L. S. n. 352), 258–267 (L. S. n. 359), 267–274 (L. S. n. 353). One (L. S. n. 374) on an altar erected by the soldiers of the 20th Legion gives A. D. 153, and of three imperfect inscriptions one (L. S. n. 386) yields possibly A.D. 219, another (L. S. n. 387) certainly A.D. 236, and a third (L. S. n. 368) not improbably A.D. 286–308. On a rock in the neighbourhood the names of the Consuls of A.D. 210 are cut.

The first Ælian Cohort of Dacians is not named in the diplomas found in the island, unless we suppose that it was the same as the *Cohors Ulpia Trajana Civium Romanorum* in Hadrian's of A.D. 124, a supposition for which I see no ground.

From the foregoing statements it appears that of the twelve stations there are *three—† *Pons Ælii*=Newcastle-upon-Tyne, ‡ *Vindobala*=Rutchester, and ‖ *Æsica*=Great Chesters—at which no memorials have been found of the troops, whose quarters, according to the *Notitia*, were in those places. We also find the following at stations

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and remarks—"The obliteration in the stone and other circumstances, lead to the conclusion that Elagabalus is the Emperor intended; he was Consul for the second time A.D. 219." In the Canadian Journal, September, 1865, I expressed the same opinion, but at the time I had not seen the stone figured, but depended merely on the copy as given in the *Monumenta Historica Britannica*. Since I have had the opportunity of examining Dr. Bruce's wood-cut, I am inclined to think that the letters before BIS were IMP, and that the numerals III were in the vacant space between COS and VEXIL. The Emperor will thus be Caracalla, and the date A.D. 212. I was led to these emendations by doubts as to the order—BIS COS instead of COS BIS for COS· II—of which I do not remember ever having seen an example. My conjecture seems to be confirmed by Hübner's *Inscrip. Hispan.* n. 1671, where we have IMP· BIS· COS· III· applied to Caracalla = A. D. 212.

* I have not counted *Segedunum*=Wallsend, as Tynemouth may reasonably be regarded as an outpost.

† Mr. Merivale, History of the Romans under the Empire, vii, p. 454, note, remarks:—"Pons Ælii of the 'Notitia Imperii' is amply identified with Newcastle-on-Tyne by inscriptions." There is unfortunately not one on which this identification can be based.

‡ Dr. Bruce, L. S. p. 41, remarks:—"No inscription has been found at Rutchester telling us what troops were quartered there, but as the preceding and following stations have been identified with *Condercum* and *Hunnum*, there can be no doubt that Rutchester is the *Vindobala* of the *Notitia*, which, according to that document, is situated between *Condercum* and *Hunnum*."

‖ See § 10.

different from those assigned to them in that record—*cohors prima Batavorum* at *Magna* = Carvoran (as well as at *Procolitia* = Carrawburgh), *cohors tertia Nerviorum* at *Vindolana*=Chesterholm, instead of *Alione*, and *cohors sexta Nerviorum* at *Æsica* = Great Chesters instead of *Virosido*. But such differences as these are not at all inconsistent with the identification, as, doubtless, for the sake of discipline and other reasons the military bodies were occasionally moved from one station to another. In these changes of quarters, however, we might expect to find at each station a succession of troops of the same kind, *i. e.* of cavalry or of infantry. Where there was a cavalry regiment there were of course stables for the horses, in addition to quarters for the men; here then *alæ* or *cohortes equitatæ* could be accommodated.

The 2nd, 6th, and 20th Legions, and Vexillations also of the same, were employed in building this wall, as they also *worked on the wall of Antoninus, but no memorials have been found here similar to those in Scotland, in which the number of paces is stated, with the name of the reigning Emperor—*Antoninus Pius.*

The list of Emperors, named or referred to in the inscriptions found in these twelve stations, begins with Hadrian and includes many of his successors up to the proclamation of Constantine (the Great) as Cæsar, *i. e.* from about A.D. 124 to 306–308. Of all these Emperors † Hadrian is the most frequently mentioned, but not so often, perhaps, as might be expected on the supposition that the wall was built under his orders. With one or two exceptions in the fourth century, all the dates are in the second and third, the majority being in the latter. It is surprising that we have not several inscriptions bearing dates within the hundred years that preceded the time of the *Notitia*, as indicated in its latest reference Several coins, however, of this period down to the time of Honorius, have been found on or near the line of the wall.

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* It was, I think, only a Vexillation of the 6th that was employed on the northern barrier.

† Dr. Bruce's assertion in "the Roman Wall," p. 382, 3rd edition, that "from Wallsend to Bowness we do not meet with a single inscription belonging to the reign of Severus" is too strong. He forgot the stone that was found at *Condercum*. See Horsley, *Brit. Rom.* Nor. ix, and *Lapidarium Septentrionale*, n. 27.

THE BIRTHPLACE OF ANCIENT RELIGIONS AND CIVILIZATION.

BY THE REV. J. CAMPBELL, M.A.

The important discoveries which, in recent years, have rewarded antiquarian research among the monuments, and especially among the written monuments, of the ancient world, have greatly tended to confirm an intelligent belief in the unity of the human race. Links, similar in character to those which the physical ethnologist finds between organisms differing in form and feature, bind in one the speakers of different languages and the inhabitants of widely separated regions. These links may be termed historical, and are found in the religions and mythologies of the nations of the earth. It is impossible to take up any work on Comparative Mythology, or treatise upon the religious systems of different peoples, and not find one's self involuntarily attempting to answer the question, "Whence comes this marvellous agreement?"

The learned Faber, who, in the early part of the present century, gave to the world, in three quarto volumes, a dissertation on the Origin of Pagan Idolatry, framed the following disjunctive judgment, which exhausts the whole field of hypothesis, and shuts the enquirer up into a definite conclusion, after a brief investigation of the subject:

1. Either all nations agreed peaceably to borrow from one, subsequent to their several settlements;

2. Or all nations, subsequent to their several settlements, were compelled by arms to adopt the superstition of one;

3. Or all nations were once assembled together in a single place and in a single community, where they adopted a corrupt form of religion, which they afterwards respectively carried with them into the lands that they colonized.

The first and second of these hypotheses carry absurdity upon their face. Is there any escape from the conclusion, which is the third? An attempt has been made to escape in two ways. The first denies that the disjunctive proposition is exhaustive of the subject; and the second calls in question the truth of the premise on which the proposition is based. Those who deny that the proposition of Faber is exhaustive, add to it a fourth hypothesis, and, showing the third to be

as untenable as the first and second, make it the conclusion. This final hypothesis may be stated as follows:

4. Or all nations, by virtue of similarity in the physical condition and mental constitution of the individuals (not necessarily of the same species) who composed them, developed independently certain similar forms of religious belief.

This is the conclusion at which a large proportion of the scientific men of the present day have arrived; a conclusion which is largely due to the prominence that physical science has acquired at the expense of historical study. Physiology and psychology, which, in the hands of the materialist, is nothing more than a higher kind of physiology, are prepared to depose the Historic Muse from her once proud eminence, to degrade her to the position of a mere annalist of indisputable facts, and themselves to set forth the origin and the destiny of man and nations. The element of truth in this fourth hypothesis has been much exaggerated in importance by the shallow thinkers who save labour by adopting it. It cannot be denied that all men act and think in conformity with the same laws of physical and mental action; but experience teaches us that the law of freedom so modifies the law of nature in man, that the details of his thought and action present an almost infinite variety. Man is a religious being, prone to worship; so that hardly a tribe of the human race is found without a divinity. Allow that mental constitution appears in this universality of worship; but what mental constitution or physical condition can account for that which is almost as universal—the bloody sacrifice? Nature may cause nations far removed from each other in time and place to frame similar laws, and even to appoint law-givers with similar functions; but by what law of mind or matter can we dispose of the Egyptian Menes, the Greek Minos, the Indian Menu, the Phrygian Manis, the Lydian Maeon or Manes, the German Mannus, and the Welsh Menw? The Pyramids of Egypt and India,[1] and the Stonehenges of Arabia, Phœnicia and England,[2] cannot be accounted for in the same way as we account for the temple-building instinct. Now, Faber utterly demolishes this fourth hypothesis by stating that "the singular, minute and regular accordance among heathen systems appears not only in what is obvious and natural, but also in what is arbitrary and circumstantial,

[1] Wheeler, Geography of Herodotus. London, 1854; p. 421.

[2] Geographical Works of Sadik Isfahani. London, 1832; p. 9. Palgrave's Travels in Centra Arabia, vol. i., p. 251. Finn, Byeways in Palestine. London, 1868; p. 283.

both in fanciful speculations and in artificial observances. The final means of escape, therefore, from the conclusion which sends us to a common cradle of the whole human race is that afforded by calling in question the truth of the above statement of Faber's. Can it be proved that the learned author of the Origin of Idolatry manufactured resemblances which did not exist, magnified mere accidental coincidences into identity of plan, or wilfully distorted facts to suit a preconceived theory? Far from it. There are instances, doubtless, in which he and others who have dealt with the same subject have allowed their general conviction to bias their judgment in particular cases of suspected agreement; but these are so few, compared with the large number of cases of indisputable connection, that they do not in the least invalidate the position which these writers have taken.

I propose, first of all, to glance briefly at a few of the connections and statements of connection which justify Faber's premise that there is "a manifest accordance among the various systems of Heathen Mythology." The myths best known at the present time, and indeed till a comparatively recent period the only ones with which English-speaking people were conversant, are those of the Greeks. It is interesting to notice Bacon's judgment upon the origin of Greek Mythology: "Many of these fables by no means appear to have been invented by the persons who relate and divulge them, whether Homer, Hesiod or others; for if I were assured that they first flowed from these later times and authors that transmitted them to us, I should never expect anything singularly great or noble from such an origin. But whoever attentively considers the thing, will find that these fables are delivered down and related by those writers, not as matters then first invented and proposed, but as things received and embraced in earlier ages. Besides, as they are differently related by writers nearly of the same ages, it is easily perceived that the relaters drew from the common stock of ancient tradition, and varied but in point of embellishment, which is their own. And this principally raises my esteem of these fables, which I receive not as the product of the age, or invention of the poets, but as sacred relics, gentle whispers and the breath of better times, that, from the traditions of more ancient nations, came at length into the flutes and trumpets of the Greeks."[3] Herodotus is very explicit in regard to the origin of Greek divinities: "Almost all the names of the gods came into Greece from Egypt. My inquiries

[3] Bacon, Wisdom of the Ancients; preface.

prove that they were all derived from a foreign source, and my opinion is that Egypt furnished the greater number. For, with the exception of Neptune and the Dioscuri, whom I mentioned above, and Juno, Vesta, Themis, the Graces and the Nereids, the other gods have been known from time immemorial in Egypt. This I assert on the authority of the Egyptians themselves. The gods with whose names they profess themselves unacquainted, the Greeks received, I believe, from the Pelasgi, except Neptune. Of him they got their knowledge from the Libyans, by whom he has been always honoured, and who were anciently the only people that had a god of the name."[4] In another place, speaking of the anomalous fact of the Greeks regarding Hercules, Bacchus and Pan, oldest of the Egyptian deities, as the youngest of the gods, Herodotus says: "To me, therefore, it is quite manifest that the names of these gods became known to the Greeks after those of their other deities, and that they count their birth from the time when they first acquired a knowledge of them."[5] In a previous paper I have illustrated the connection in religious observance or worship between Greece, Egypt and Phœnicia.[6] Every classical scholar is familiar with some of the many myths that cluster round the name of Cadmus, and serve to bind Syria and Greece together. M. Maury, in his notes to the 7th book of Guigniaut, on the Relations of the worship of Bacchus in Egypt, thus speaks of the connection among themselves of religions which he has already indissolubly united to those of the Greeks. "The study of the religions of Western Asia reveals to us the innumerable points of resemblance which existed between the divinities of the banks of the Nile and those of Phœnicia and Syria, the worship of which extended afterwards into Phrygia, Lydia and Cappadocia. The myths of Attis and Cybele, of Adonis and Astarte, present an analogy to that of Osiris and Isis which cannot be got rid of. And we cannot withstand the impression that these religions had in part a common origin, as M. Guigniaut has shown in his Notes, &c., on the 4th book of this work."[7] The celebrated Bryant, speaking of Greek historians, says: "The whole Theology of Greece was derived from the East. We cannot, therefore, but in reason suppose that Clement of Alexandria, Eusebius of Cæsarea, Tatianus of Assyria, Lucianus of Samosata,

[4] Rawlinson's Herodotus, Bk. ii., ch. 50.

[5] Id., Bk. ii., ch. 146.

[6] "The Pharaoh of the Exodus Identified in the Myth of Adonis," in the *Canadian Journa* May, 1871, p. 36.

[7] Guigniaut, Religions de l'Antiquité. Tome iii., 924.

Cyril of Jerusalem, Porphyry of Syria, Proclus of Lydia, Philo of Byblus, Strabo of Amasa, Pausanias of Cappadocia, Eratosthenes of Cyrene must know more upon this subject than any native Helladian. The like may be said of Diodorus, Josephus, Cedrenus, Syncellus, Zonaras, Eustathius and numberless more. These had the archives of ancient temples to which they could apply, (Philo Byblius mentions many authors in Phœnicia to which he applied); and had traditions more genuine than ever reached Greece."[8] Creuzer, who preceded Guigniaut and Maury, and who carefully abstained from the magnificent generalization and dogmatic theorizing of Bryant, having withal no remnant of Noah's ark to identify, or other preconceived notion to justify, in treating of Greek mythology, is constrained to speak as follows: "We cannot repeat it too frequently: if, in the study of Greek mythology, we desire to arrive at the lowest foundation, we must consult the Oriental dogmas, and not imagine, as many still do, that the gods of Homer are the most ancient known and adored by the Greeks. There are, on the contrary, gods far more ancient than these, of whom indeed authors have transmitted to us but little and obscure information. To complete and make clear the knowledge they afford we must betake ourselves to the monuments of ancient literature in Persia and in India. These exhibit, in all its truth and fulness, the organic development of ancient religions."[9]

If, passing from the Greek, we take up the Latin mythology, we find that, in all its branches, there is much of what one might be tempted to call a reproduction of the Greek, but possessing so distinctive a character that we must conclude against the theory of either people borrowing from the other. While the remains of the Sabine religion are strongly Egyptian in character, those of the Etruscan mythology, as Maury shows, manifest a very decided Perso-Assyrian connection, and are historically linked with the ancient Lydian state.[10]

We do not need the statement of Taliessin that the Britons came from Asia,[11] nor the authority of the Book of Conquests for deriving the ancient Irish stock from Africa,[12] to prove the eastern origin of the Celtic nations; since their mythological history and worship connect

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[8] Bryant's Analysis of Ancient Mythology, i., 143.

[9] Creuzer, Symbolik und Mythologie der alten Völker. Theil ii., Heft iii. Nachtrag 3.

[10] Guigniaut, ii., 493. Id., ii., 1204. Herodotus, i., 94.

[11] Davies, British Druids, x.

[12] Keating's General History of Ireland, p. 84, &c.

them with Egypt and Phœnicia.[13] Finn Magnusen, who first compared the Scandinavian and Persian systems of mythology, pointed out the striking coincidences every where manifest between them; and later writers have rendered it still more apparent.[14] Grimm leaves little doubt in the mind of an unprejudiced reader that the Germanic theology (which includes the Scandinavian) has certain affinities with the Celtic, widely as the two peoples, Germans and Celts, may differ; and that Lithuanian gods may be found among the Hindoos in a Sanskrit dress.[15] The Slavonian peoples, with whom the Lithuanians are often identified, occupy a peculiar position, in language approaching the Latins, and in religion the Persians and Indians. Carl Ritter cannot account for such undoubted traces of Indian mythology and religious observance as appear among many European peoples, otherwise than by the supposition that colonies of Indian priests settled around the Black Sea, in Thrace, and even in countries farther west.[16] Not only into Europe, however, but also into Africa, these priests of Brahma and Buddha must have penetrated, if Ritter's hypothesis be the solution of the question—how did the similarity between the religions of India and those of western peoples originate? and the following statement by Dr. Pritchard be correct. "Some of the earliest travellers in India were struck with many religious ceremonies and theological fables prevalent in that country, which they observed to bear a comparison with parallel portions of the Egyptian system. Père Catrou, a Jesuit missionary, was, I believe, the first who remarked this connexion. La Croze followed him, and pointed the way for an ample investigation of the subject, and for the exertion of much ingenuity in tracing a variety of coincidences. These are found to amount, according to the general opinion of the learned in the present day, to a satisfactory proof that the mythology of the East emanated from the same source from which the fables of Egypt are derived."[17] It is not at all surprising to find after this that Indian gods have a place in Persian mythology, so that Burnouf could say, in speaking of the identity of Yima-Kshæta, Thrætana and Keresaspa with Yama, Trita and Krisasva: "It is undoubtedly very strange to see one of the most

[13] Banier, La Mythologie et les Fables expliquées par l'histoire, ii., 616.

[14] Blackwell, in his edition of Mallet's Northern Antiquities, p. 471.

[15] Grimm, Deutsche Mythologie, 137, &c., 765, &c.

[16] Ritter, Die Vorhalle Europäischer Völkergeschichten vor Herodotus.

[17] Researches into the Physical History of Man, p. 341.

venerated of Indian divinities (Yama) give his name to the first sovereign of the Ario-Persian dynasty (Yima-Kshæta or Jemschid): it is one of the facts which most evidently attest the intimate union of the two branches of the great family, which extended many ages before our era from the Ganges to the Euphrates."[1] Sir William Jones shewed the affinities of the Hindoos with almost every other nation; and found no difficulty in establishing a great resemblance in the religious belief and ceremonial usages of all the people who inhabited the central parts of the Asiatic continent, and even of the Chinese and Tartars themselves, who were farther removed from the primeval seat of learning and civilization.[19] Turning to the "mythology of the Babylonians, the first point which attracts attention is the apparent similarity of the system with that which afterwards prevailed in Greece and Rome. The same general grouping is to be recognized; the same genealogical succession is not unfrequently to be traced; and in some cases even the familiar names and titles of classical deities can be explained from Babylonian sources. It seems, indeed, to be highly probable that among the primitive tribes who dwelt on the Tigris and Euphrates, when the cuneiform alphabet was invented by reducing pictures to phonetic signs, and when such writing was first applied to the purposes of religion, a Scythic or Scytho-Arian race must have existed, who subsequently migrated to Europe, and brought with them those mythical traditions which, as objects of popular belief, had been mixed up in the nascent literature of their native country; so that we are at present able in some cases to explain obscurities both of Greek and Roman mythological nomenclature, not simply from the languages of Assyria and Babylonia, but even from the peculiar and often fantastic devices of the cuneiform system of writing."[20] A people very different in character from the Greeks and Romans, namely, the Arabians, worshipped the gods of Babylonia. "It is impossible" say Lenormant and Chevalier "not to identify the Chaldæo-Assyrian gods—Ilu, Bel, Shamash, Ishtar, Sin, Samdan, Nisroch, in the gods of Yemen—Il, Bil, Shems, Athtor, Sin, Simdan, Nasr."[21] It would be a simple matter to swell the number of statements and evidences of connection among the mythologies of the different nations of the earth to such an

[18] Max Müller, Science of Language, 2nd Series, Lecture xi.

[19] Pococke, India in Greece, p. 251. Russell's Connection of Sacred and Profane History, b Wheeler, ii., p. 43.

[20] Rawlinson's Herodotus, App. Bk. i., Essay x., Sec. i.

[21] Lenormant and Chevalier, Ancient History of the East, ii., p. 322.

extent as to fill a large volume. The literature upon the subject is vast, and is daily increasing. Nor is the subject an obscure one: on the contrary, many of the connections established are obvious to the most superficial observer. Thus the Syrian and Phœnician Baal is the Babylonian Bel, the Indian Bali, the Greek Belus, the German and Celtic Beli. Astarte becomes the Egyptian Athor, the Syrian Athara, the Arabian Athtor, the Chaldean Ishtar, and the Celtic Ostara, (whence Easter): a closely allied goddess, Anat or Anta of Egypt, is the Persian Anaitis and the Phœnician and Carthaginian Tanaitis: and Anna Perenna of the Romans agrees in all respects with Anna Pourna of the Hindoos. The Persian Tir and the Scandinavian Tyr are the same; the Etruscan Mantus and the Egyptian Amenthe; the Greek Ceres, the Indian Cris, and the Welsh Ceridwen. In the Egyptian Ptah Soccari and Sem Hercules one can hardly fail to detect the Indian Buddha Soukra and the Sabine Semo Sancus. "The names of the children of Ammon, as well as of Chemosh their god," says Sir J. G. Wilkinson, "are too near to the Khem and Amun of Egypt to be accidental."[22] Enough, I think, has been said to show that materials are not wanting to justify the position taken by Faber, and to deprive the sceptic of the last argument by which he seeks to overthrow his conclusion.

It may very naturally be asked, however, that evidence distinct from and in addition to that of a mere community of gods should be given of such an intimate connection among the various nations of the world as Faber supposes to have existed prior to the historic period. This evidence may be of two kinds: the most satisfactory, that of direct assertion or statement of historical fact; the second, that of inference, similar to the evidence on which Faber builds his theory. The first of these two kinds of evidence we find very decidedly in the writings of the Greeks. "Greek traditions establish various relations or mythical connexions between Egypt and Upper Asia. For example, Cepheus, in whom the primitive East is personified, is given as a son of Belus, a supposed King of Egypt. Belus himself is said to have transplanted the Chaldeans from Egypt to Babylonia, and to have naturalized Egyptian institutions there."[23] Perseus is a Greek, but Herodotus tells us that the Persians called him an Assyrian, and that the Egyptians claim him

[22] Rawlinson's Herodotus, App. Bk. iii., Essay i., Sec. 21.
[23] Guigniaut, iii., 601.

as a native of Chemmis.[24] The Scythians are derived from Hercules, and the whole known world included in the Greek genealogies.[25] The Egyptian and Phoenician derivation of many Greek peoples I have shown in a previous paper to be a cardinal belief of the Greek historians.[26] The Romans derived themselves from the Trojans, although Picus was an Assyrian king, and Saturn came from Crete, and the Etruscans claimed kindred with ancient Lydia.[27] The Lydians themselves, through Agron, Ninus and Belus, are derived from the royal line of Assyria.[28] The ancient Indian traditions give us the name of the Ionians as a people bordering on Hindoostan,[29] while the Shah Nameh makes the land of the Berbers part of Persia, the king of which reigns in Jerusalem.[30] The shepherd invasion of Egypt was an event that so nearly concerned the Hindoos that a tradition concerning it is found among their writings.[31] The Germans looked back to Asgard on the Don, or farther east still,[32] and the Celts to Deffrobane or Taprobane,[33] as the lands of their nativity as nations. Even the Phoenicians must be brought from the Red Sea,[34] and the Moors from Arabia,[35] long centuries before the Christian era. The Irish records give a most circumstantial account of the wanderings of the Hibernian family or families from the distant east, where Greeks, Assyrians, Egyptians, Spaniards and Danes were strangely intermingled.[36] Somewhat similar is the statement made by Hiempsal, king of the Numidians, concerning the original inhabitants of northern Africa.[37] These are but examples of what I have found almost universally in the so-called mythical histories of ancient peoples—first, a derivation from the East; and second, a drawing close together and mixing up of peoples widely separated and thoroughly distinct from each other at the commencement of the historical period. Were these

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[24] Herodot. iv., 54, and ii., 92.

[25] Müller's Dorians. Oxford, 1830; i., 490.

[26] The Pharaoh of the Exodus, &c. *Canadian Journal*, May, 1871, p. 36.

[27] Livii Hist. Lib. i. Cory's Ancient Fragments, p. 76. Shuckford's Connection of Sacred and Profane History, iii., p. 53. Vide Note 10.

[28] Herodot. i., 7.

[29] Wilson, Vishnu Purana, p. 194.

[30] Atkinson, Shah Namah, p. 161. Le Dabistan, Paris, Tom. i., p. 50.

[31] Asiatic Researches, vol. iii., p. 46, p. 225, &c.

[32] Anthon's Classical Dictionary. Art. Odin.

[33] Davies, British Druids, p. 98.

[34] Herodot. vii., 89. Justin. xviii., 3, 2.

[35] Russell's Connection, by Wheeler, ii., 248.

[36] Keating's General History of Ireland, 86.

[37] Sallustii Bellum Jugurth., xviii.

peculiarities confined to a few unenlightened peoples, such as the ancient Germans and Britons, it would be a graceful thing to admit that the schoolmaster was abroad when the so-called myth sprang into being, and there leave the matter. But when they are found common to the traditions of Phœnicia, Egypt, Chaldea, Persia, India, Arabia, Ethiopia, North Africa, Italy, Greece, the Celtic and Germanic peoples and the numerous families of Asia Minor; when they are seen to have been perpetuated from age to age, and retained in spite of advancing knowledge, even to the prejudice of the traditions in which they are found; when the romance of the middle ages, spite of all the changes to which it subjects the old world story, did not discard them nor alter what were well known as geographical absurdities and unheard of relations among nations: it is then wise to ask if no other reason than universal unbounded ignorance in regard to relation and locality on the part of the ancients can be given for their singular agreement in these particulars.

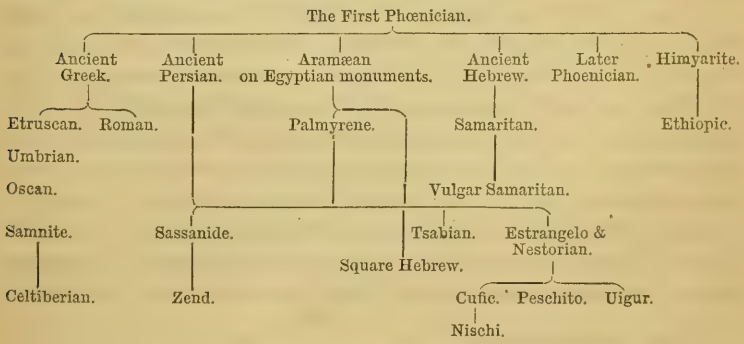
So numerous are the facts, from a consideration of which the intimate connection of all peoples prior to the historic period may be inferred, that I can simply indicate a few of the classes into which they may be divided. Some are philological in character. The study of comparative philology has resulted in an established belief in the common origin of the languages called Indo-European. It has, however, been customary to erect a barrier between the Semitic and the Indo-European languages, and thus to cut off Phœnician, Hebrew, Chaldee, Arabic, &c., from the last great brotherhood of tongues, while Coptic, Ethiopic, and the languages of the Assyrian inscriptions have been kept in a state of suspense, being assigned now to one family and now to another. It must surely have occurred to those who hold out most strongly for a radical diversity of the Semitic from the Indo-European languages, that the many connections of old Greek, Bœotic especially, with Phœnician,[38] and the conclusion often arrived at that the Pelasgian and Phœnician tongues were identical;[39] the fact that Coptic lies midway between the Semitic and Indo-European languages, and comes nearest of all to the Celtic branch of the latter;[40] and the unsatisfactory way in which the difficulty that leaves the cuneiform inscriptions of Chaldea between heaven and earth is removed by calling them Hamitic:—from these considerations—it must surely have

[38] Stillingfleet, Origines Sacrae, p. 400. Rawlinson in Herod. ii., 49.
[39] Russell's Connection, by Wheeler, ii., 99.
[40] Pococke, India in Greece, 208. Rawlinson, Herod. App. Bk. ii., Ch. 1.

occurred to such philologists, as it has to Sir Henry Rawlinson, possible that Indo-European and Semitic might be traced to a common parent form of speech.[41] Hitzig has discovered that the language of the Philistines, intimately as they must have associated with the Phœnicians proper to the north, the Hebrews in the east, and the Egyptians on the south, manifests no Semitic but decidedly Indo-European affinities, occupying a position midway between the Sanskrit and the Greek.[42] The theory of an ancient Cushite civilization has been developed in recent years out of the language of the Himyaritic inscriptions, a theory bearing much resemblance to the Finnic hypothesis of Arndt and Rask. Traces of the Cushites are found with more or less distinctness in Phœnicia, Arabia, Persia, India, Chaldea, Ethiopia, North Africa, Italy, Spain, and even in Ireland, by writers who have adopted the Cushite hypothesis; and it is clearly shewn by them that not a language in the world has escaped altogether from Himyaritic influences.[43] In regard to alphabets we learn from Herodotus that the Ionian letters were much the same as the Phœnician.[44] Dr. Thomson, the author of The Land and the Book, speaking of that famous monument of Phœnician literature, the inscribed sarcophagus of Ashmunazar, says: "Many of the letters so clearly resemble those of our own alphabet that we can scarcely be mistaken in tracing ours up through the Roman and the Greek to that of Phœnicia. Still more interesting is the fact that the characters on this stone are so like the old Hebrew as to establish their clear relationship, if not their actual identity."[45] In an article upon the Moabite stone so recently discovered, Dr. A. B. Davidson has the following: "This primal Semitic inscription shows that 900 years before Christ, at least, an alphabet was in use among the Semitic tribes of Palestine; that the alphabet was employed in public monuments by the meanest and lowest of them in the scale of civilization; that it is essentially the alphabet which we call Phœnician; that, in all likelihood, it was common to all the Semitic races of Asia, being also most probably invented by them; that it is the alphabet which was carried into Greece; and that, as modified at Rome, it is the alphabet which we now use. Further, though we cannot say precisely at what date the Greeks received this alphabet, whether

41 Rawlinson's Herodotus, App. Bk. i., Essay vi., Sec. 18.
42 Hitzig, Urgeschichte und Mythologie der Philistäer, vi.
43 Baldwin, Prehistoric Nations. New York, 1869.
44 Herodot. v., 59.
45 Thomson, The Land and the Book. London, 1868, p. 139.

before the date of this inscription or no, it is certain that at the time they received it the Semitic alphabet was complete, consisting of twenty-two letters. Of these, twenty-one are found on this inscription, and the other certainly occurred several times on the monument. The oldest Greek alphabet corresponds very closely to that on the monument. And whether the Greeks accepted at first all the letters they afterward used or no, it is certain that all their alphabet came ultimately from this, and that it was all at their disposal at the time they received any of it."[46] Professor Rawlinson, in a note on the 58th chapter of the 5th book of Herodotus, in which the Greek alphabet is traced to a Phœnician source, says: "This is strong evidence to the fact that European Greece got its alphabet direct from the Phœnicians. Otherwise there is so great a similarity between the various alphabets of Western Asia and Southern Europe (the Lycian, Phrygian, Etruscan, Umbrian, &c.,) that it would be difficult to prove more than their common origin from a single type, which might be one anterior to the Phœnician." Runic and Etruscan characters, we are told, have been found in Central Arabia, supposed to be the home of the old Cushite race that included the Phœnician.[47] The Gauls had letters something like the early Greek letters of Cadmus.[48] And even the Touariks of the Sahara, according to M. Boissonnet, have an alphabet almost identical with that of ancient Phœnicia.[49] The following table of Gesenius must, I believe, shew some nearer relationship between the peoples who wrote the characters he has arranged in genealogical order than has been generally admitted:—



[46] British and Foreign Evangelical Review, No. lxxv., p. 159.
[47] Baldwin, Prehistoric Nations, 87.
[48] Davies, Celtic Researches, 242.
[49] Journal Asiatique. Mai, 1847.

It is gratifying to see that even alphabetical forms help to swell the tide of evidence that flows in the direction indicated and required by Faber's hypothesis. The presence of foreign words in a modern language does not excite wonder, since the intercourse of nations and the spread of knowledge make it a necessary result; but it is worthy of attention that almost all the sacred appellations of the Etruscans show an eastern origin,[50] that the musical instruments of the Greeks have Syrian names,[51] and that words and phrases of almost pure Hebrew occur in the oldest of Welsh poems.[52]

Another class of facts illustrative of the intimate connections existing between peoples prior to the historic period may be termed geographico-philological. The author of that suggestive book, "India in Greece," says that the names of places must be explained by the language of the people inhabiting them if the ordinary theory of ancient history be the true one; in Greece this cannot be.[53] What is true of Greece is true of the whole ancient world. Names of places, like the names of mythical characters, may in many (not all) cases, after being subjected to the most arbitrary treatment, be made capable of receiving certain far-fetched and absurd significations; but no sensible man who has puzzled over ancient geographical nomenclature ever felt satisfied with these. Mr. Pococke would reduce all geographical names whatsoever to the language of the Vedas, because he finds that language serviceable (as no doubt it is) in explaining the names which are common to Europe and Western Asia and to the Indian peninsula. I believe that Bochart was far nearer the mark when he sought to accomplish a similar task by the aid of a Phœnician dialect manufactured for the purpose. The most important fact in connection with this class of evidence is that the same geographical names are found in many different parts of the world, generally applied to the same objects, as districts, cities, rivers, mountains, &c., and even that several names frequently occur in exactly the same geographical order and connection in different countries. Thebes in Egypt, Palestine, Asia Minor and Greece; Belka (Boulak), in Egypt, Balkh, in Persia, and Phylace (Phulake), in Greece; Tentyra, in Egypt, Tantura in Palestine, and Tyndaris, in Sicily and Marmarica;

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50 Vossii de Idololatriæ, L. ii., c. 57.

51 Strabo, x., 3, 17.

52 Davies, British Druids, 137, 564, 573, &c.

53 Pococke, India in Greece, 22.

the Jordan of Palestine, the Jardanus of Elis and Crete, and the Eridanus of Italy; Meru of India, Moore of Persia and Meroe of Ethiopia; Atabyrion, (or Tabor,) in Palestine, and Atabyron in Persia, Rhodes and Sicily: these are examples of an almost endless connection. A very striking instance of the double connection of several names of places is given by Pococke in Accho, Kishen, Carmel and Dor, which, with Magadha for Megiddo, occur in the same order in India as in Palestine.[54] Ritter, speaking of the position of Ophir, says "Ophir is sometimes used by the ancients to designate countries which lie far apart and in different directions. * * * Hartmann draws the inference that Ophir was one of those wandering names, like Tartessus, Cush, Taurus and the like, and that it was first given to a port of Southern Arabia; but when emigration began, and the inhabitants pushed their way further on and established colonies on the coast of Africa and India, the name too was transplanted and multiplied, and many Ophirs were to be found. His theory furnishes a satisfactory solution of the fact that, for whatever cause, many places bearing the same name are continually referred to in the ancient records, manifestly lying widely apart."[55] With all truthfulness Pococke may say "The whole map is positively nothing less than a journal of emigration on the most gigantic scale."[56] An emigration of the character to which he refers must have had one, not many, starting points, and thus sends us back to a great centre such as that of which Faber speaks.

Monuments, not more enduring, indeed, but more substantial than names, add their weight to the preponderance of evidence in favour of the commencement of civilization in a single locality. Such are the numberless objects preserved in archæological museums, or descriptions of which are furnished in ancient writings, that exhibit mechanical skill. Mr. Osburn informs us that the garners pictured on the Egyptian monuments are the same as those now used in parts of Greece and Italy.[57] The chariots of the ancient Britons were the same as those used by the Greeks at the siege of Troy, by the nations of Palestine, and by the Egyptians.[58] Diodorus Siculus mentions the use of the old Egyptian waterwheel in Spain.[59] The Celtic church-plank,

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[54] Id. 223.

[55] Ritter, Comparative Geography of Palestine, &c. Edinburgh, 1866; p. 94.

[56] Pococke, India in Greece, 47.

[57] Osburn, Monumental History of Egypt, i., 452.

[58] Cæsaris de bello Gallic, iv., 33. Taciti Agricola, 12. Diod. Sic. v. 16.

[59] Diod. Sic. v. 25.

used in place of a bell for calling together the congregation, appears in the Greek *Σημάντρον* or the *nakoos* of the Armenians, which is found in many parts of the East.[60] "Assyrian sculpture," say Lenormant and Chevalier, "is one of the greatest of ancient arts; its teachings, received and transmitted by the peoples of Asia Minor, presided over the first steps of Grecian sculpture. Between the works of Ninevite artists and the early works of the Greeks, even to the Aeginetans, we may observe an astonishing connection; the celebrated primitive bas-relief of Athens, known by the common name of the 'Warrior of Marathon,' seems as if detached from the walls of Khorsabad or Koyundjik."[61] Sir J. G. Wilkinson holds that Assyrian and Greek pottery, sculpture, architecture, &c., were to a great extent borrowed from the Egyptians;[62] and Lenormant and Chevalier make Phœnician art a mixture of Assyrian and Egyptian.[63] "Cotton stuffs and indigo must have been known to the Israelites from a very ancient period; for they have been found in the burial places of Thebes, which date back to the eighteenth Egyptian dynasty, and which were used for purposes of sepulture from 1822 to 1476 B.C. Both of them must have been of Indian origin."[64] Mr. Baldwin, in his Prehistoric Nations, quotes Dr. Livingstone in favour of his adopted Cushite hypothesis; the extract will answer as well or a great deal better for Faber's. "Dr. Livingstone, in the account of his 'Expedition to the Zambesi,' describes articles manufactured by the African people, and specifies 'hammers, tongs, hoes, adzes, fish-hooks, needles, and spear-heads, having what is termed *dish* on both sides, to give them the rotary motion of rifle-balls.' He admires their skill in spinning and weaving, and in manufacturing certain kinds of pottery, similar to pottery found in India. He points out that they have admirably-made fish nets, 'nearly identical with those now used in Normandy;' a blacksmith's bellows like that used in Central India; 'fish-baskets and weirs like those used in the Highlands of Scotland;' and other implements like those found in Egypt and India. He is sure that this striking similarity of manufactured articles in widely-separated countries — articles 'from identical patterns widely spread over the globe'—makes it very probable that the arts and usages of these different people were derived

[60] Finn, Byeways in Palestine, 440.
[61] Lenormant and Chevalier, i., 465.
[62] Wilkinson, A Popular Account of the Ancient Egyptians, ii., 263.
[63] Lenormant and Chevalier, ii., 232.
[64] Ritter, Comparative Geography of Palestine, &c., i., 121.

from the same source. Not seeing any other explanation, he suggests that they may have been given by direct revelation from God. This hypothesis is reverent, but the very interesting fact to which he calls attention can be explained without resort to miracle. The original instructor in these arts was the ancient Cushite civilization, which went into Africa from the east and the north, and was felt for a very long period of time in all its central countries."[65]. The merest tyro in archæology would find little difficulty in filling an entire number of the Journal with extracts illustrative of this third class of facts.

Another class of facts may be called ethological. I do not use this word in the same sense as Sir William Hamilton or Mr. Mill, nor is it indeed the same word which they employ; since *ἔΘΟΣ*, rite, custom, and not their *ἦΘΟΣ*, disposition, character, is the root. Ethology would thus be the doctrine of customs or rites. Among the most notable rites practised in different parts of the world are those connected with burial, and which the name of Charon, the ferryman of the Styx, at once suggests. Diodorus Siculus brings these rites from Egypt, with many other ceremonies;[66] and even the Muscovites, it appears, received the knowledge of them.[67] Pluto and the paraphernalia of Hades wandered westward from the Stygian fount in Idumea, through Greece, Sicily and Gallia Narbonensis, to Spain.[68] The branch of gold, gathered from a tree in the wood of Hecate, is plainly the mistletoe of the Druids;[68*] the Gallic forest-worship is the grove-worship of Palestine;[69] the Druidical cauldron is that of Dodona;[70] and Taliessin's Metempsychosis claims kindred with that of the Hindoos.[71] The rites of Ceres, or the Eleusinian mysteries, may be traced in Egypt, India and Britain as distinctly as in Greece.[72] The extent to which circumcision is found to have been practised has led many to deny the fact of its being a purely Abrahamic institution.[73] Phallus-worship, often wrongly connected with this rite, is found to have been still more widely diffused.[74] Festivals of lamps and Bale-(Baal)fires

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65 Baldwin, Prehistoric Nations, 327.
66 Diod. Sic. i., Sec. ii., 34, 36.
67 Banier, ii., 436.
68 Id. ii., 449.
68* Virgilii Æneis, vi., 201.
69 Id. ii., 624.
70 Davies, British Druids, 217.
71 Id., 573.
72 Herodot., ii., 171. Asiatic Researches, v., 297. Strabo, iv., 4 6.
73 Kenrick, Ancient Egypt under the Pharaohs, i., 376.
74 Maurice, Indian Antiquities, Vol. i., Pt. i., p. 264.

are not confined to one nation, but preserve among different peoples the memory of a time when all dwelt within the same illuminated circle.[75]

Facts connected with literary and scientific institutions attest the same truth. The identity of the four books of Indian and of Egyptian Scripture;[76] the similarity between the Ramayana and Mahabharata and the Dionysiacs of Nonnus;[77] the agreement of the priests of Memphis with the Brahmins of Benares in their division of the earth;[78] the wide diffusion of the stories of Rhampsinitus and his treasury, of Rhodope, of Midas and the ass's ears, of the mice at Pelusium, of Melampus and the cows, of a partial deluge, &c.;[79] the minute coincidences in the most arbitrary of astronomical systems;[80] all these are worthy of consideration in a cumulative argument.

I close the testimony to the truth of Faber's premise, and thus of his legitimately drawn conclusion, by citing a few of the authors who have been led from various kinds of evidence to the belief that nations now widely separated were once parts of a single community. Weber thinks that Menu and similar names (Minos, Menes, &c.) arose before the separation of the Indo-European stock.[81] Pococke holds a national unity of Egyptians, Greeks and Indians.[82] Sozomen speaks of the Ethiopians as Indians,[83] and other ancient writers insist that they are the same people,[84] a conclusion to which the historian Alison arrived on hearing of the conduct of the Sepoys in Egypt in 1801.[85] The names of Wilford and Tod are on the side of an Indo-Greek connection.[86] Sir J. G. Wilkinson finds the Egyptians as an Aryan race in Asia;[87]

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75 Wheeler, Geog. of Herodotus, 453. Jamieson, Scottish Dictionary, Art. Beltane.

76 The four books of Hermes (Clem. Alex., Strom. vi., 4), and the four Vedas. Asiatic Researches, iii. De Lanoye's Rameses the Great, Appendix, Note 1.

77 Asiatic Researches, i., 258. Guigniaut, iii., 1016.

78 Wheeler, Geography of Herodotus, 36.

79 Guig. ii., 330. G. W. in Rawlinson's Herod., ii., 121. Smith, Dict. of Greek and Roman Biography and Mythology, Art. Rhodopis. Ovid, Metamorphoses, xi. Keating's Ireland, 190. Hitzig, die Philistäer, 201. Compare the story of Melampus with that of Sarama in the Rig Veda. *Vide* Max Müller's Lecture XI., Second Series, on Science of Language.

80 Rawlinson's Herodotus, App. Bk. ii., ch. 7.

81 Journal Asiatic Society, Vol. XX., 3 and 4, p. 429.

82 India in Greece, 122.

83 Sozomen, ii., ch. 24.

84 Russell's Connection, by Wheeler, ii., 271.

85 Alison, History of Europe, 8vo., 1843, Vol. IV., p. 595, note. The Sepoys, finding themselves in the midst of emblems of their own religion, fell on their faces and worshipped.

86 Pococke's India in Greece, 145.

87 Wilkinson, A Popular Account of the Ancient Egyptians, i., 302.

while Professor Rawlinson derives the Chaldeans from Meroe.[88] The Atlantica of Olaus Rudbeck brings Greeks and Romans, Germans and Danes from Sweden, which he makes the Atlantis of Plato.[89] Von Hammer calls the Germans a Bactriano-Median nation and gives them a local habitation of the past in Khorassan.[90] Dom Pezron, who wrote on the "Origin and antiquity of the Celtic tongue," would have Celts to be the chief people of the ancient world.[91] Dr. Pritchard's Eastern origin of the Celtic nations is well known; and the latter part of his Researches into the Physical History of Man, which happily deals with anything rather than physical history, is so full of links to connect civilized peoples one with the other that it almost appears as if it were written for the special purpose of proving Faber right.[92]

Enough I think has been said to show that "all nations were once assembled together in a single place and in a single community, where they adopted a corrupt form of religion which they afterwards respectively carried with them into the lands that they colonized;" the term "all nations" being understood generally of *civilized peoples*, and not absolutely of *all*, except in regard to the time prior to the earliest dispersion, and the terms "single place" and "single community," except in regard to the same, being capable of sufficient expansion to denote an empire half as large as that of Alexander the Great, of which the states that constituted and the tribes that peopled it were distinct one from the other.

It has proved a far more difficult matter to settle the locality in which the primitive civilization, that Faber and others have supposed, sprang into existence, than to justify a belief in their conclusion. A faithful adherence, not to the letter of the Bible, but to the inferences of early commentators, has shut up believers in the truth of the statements contained in the book of Genesis to a single centre, from which the human race spread at a very remote period, and to a later central seat of civilization and empire. The first is the mountainous region of Armenia; the second, the plain of Shinar. The idea commonly entertained in regard to the dispersion from Armenia is, that the grandsons of Noah at once betook themselves to the regions which, at the com-

[88] Rawlinson's Herodot., App. Bk. i, Essay vi, sec. 16.

[89] Atlantica, Sive vera Japheti posterorum sedes ac patria, 1679-98.

[90] Von Hammer, Wien Jahrbuch, ii., 319.

[91] Pezron, Antiquités de la Nation et de la Langue des Celtes. Paris, 1703.

[92] Physical History of Man, from p. 318.

mencement of the historic period, bore their names, or could in some way be identified with them or their descendents. In accordance with this view, Javan, the fourth son of Japheth, is represented as moving through hundreds of miles of an uninhabited wilderness, and over rivers and seas, to Greece, the abode of the Ionians; settling his eldest son Elisha in Elis, sending Tarshish, the second, far off to Tartessus in Spain, and Kittim, the third, to Macedonia, nearer at hand, while Dodanim, the youngest, either founds the oracle of Dodona, or, the initial *daleth* of his name being transmuted to *resh*, emigrates to Rhodes. For this absurd trifling with history there is not the slightest authority in the language of Scripture. Many reasons may be given for not adopting this crude theory of the origin of nations and the peopling of the countries of the earth. One that will suggest itself to any practical mind is the unlikelihood of small families, in the world's second infancy, finding a reason for emigrating to any great distance from the original centre, to which they were bound by mutual ties. Even allowing that very early migrations did take place, we have the example of Abraham (and even his was a very peculiar case), together with the testimony of history in all ages, even to the present day, as our authorities for saying that the progress of the emigrants from one seat to another must have been very gradual, and with long periods of time intervening. The first migration we do read of is not northward through a wild and inhospitable and difficult tract, where but little provision for the way could be found, but southward into a warm and fertile region, watered by the Tigris and Euphrates. Every consideration would prompt the small band that set out from Armenia to preserve its unity; and the facts that they feared lest they should "be scattered abroad upon the face of the whole earth," and that God is represented as saying, "Behold the people is one and they have all one language," tend to prove that this unity was maintained until the dispersion of Babel.[93] At Babel a dispersion certainly did take place. Are we then to decide that from Mesopotamia at this point of time men carried to their respective settlements the mythology, arts, literature, etc., that we find common to so many nations? I answer emphatically, No! And here I take objection, as I have hinted above, to the form in which Faber puts his conclusion. "Single place" and "single community" suit the times before the dispersion of Babel very well; but they do not suit the facts upon which Faber founds his

[93] Genesis, xi., 4. 6.

hypothesis. If the Arkite theory, upon which Bryant spent so much labour, be found untenable, because based upon a forced interpretation of every rite and myth of the ancients as a reminiscence of the Noachian deluge, as untenable must the theory be which makes a Babel of mythology by seeking to harmonize it with a reminiscence of what might have occurred in that ancient seat. Even more unintelligible is the latter theory, inasmuch as Nimrod, the great hero of whom all nations are supposed to have had a grateful remembrance, was, in all probability, posterior to the dispersion, or at least contemporary with it. Moreover, we have found that the ancient traditions regard Babylonia, not as the primitive seat of empire, but as occupying a very secondary position, receiving its religion by way of the Erythræan sea, and its royal line from Egypt.[94] The arts and mythology of Chaldæa are generally allowed to be derived from some other source.[95]

The great centre to which all the tribes of men gradually converged was Egypt. Whether Noah himself moved westward and planted vines in Hebron, which was built seven years before Zoan in Egypt, as the Rabbins inform us,[96] will be a difficult question to answer; but there can be little doubt that the great majority of his descendants, or at least those of them whose life history, in its mythical or accepted forms, cares to record, did pass through Palestine and Arabia on their way to the banks of the Nile. One of the earliest seats of civilization I believe to have been what M. de Lanoye calls "the opulent pentapolis of the Jordan;"[97] and the earliest of all legends, which many have confused with the story of the Noachian flood, I am convinced arose from the overthrow of the Cities of the Plain. Here, or in the region between the Nile and the Dead Sea, I unhesitatingly place the deluges of Deucalion and Ogyges, with the accompanying events that form an

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[94] Oannes, mentioned by Berosus, who came by way of the Red Sea, brought letters and religion with him to Babylonia. Belus, brother of Agenor, and father of Ægyptus, connects Babylonia, as its first monarch, with Phœnicia and Egypt.

[95] Baldwin, Prehistoric Nations, 186. Rawlinson's Herodot., App. Bk. i., Essay vi., sec. 16, &c.

[96] Ritter, Comparative Geography of Palestine, iii., 297.

[97] "Since the opulent Pentapolis of the Jordan had sunk in the bituminous gulf of the Dead Sea, the most compact centres of permanent population, existing between Egypt and Upper Asia, were the maritime establishments which the Cushites of Canaan, driven from the shores of the Erythræan Gulf by convulsions of the soil, had founded upon the Syrian coast; the fortified cities which the Chetas (Hittites) had built between the Orontes and the Euphrates; and lastly, Babel, in the land of Sengar, where a celebrated temple of the Sun and great navigable river, attracted caravans and flotillas of pilgrims and traders from all directions." Rameses the Great, 117.

introduction to the history of civilization. One of the oldest of ancient records, the Phœnician History of Sanchoniatho, while commencing with Phœnicia proper (Tyre, Sidon, Byblus, &c., which may have been transported names from the original home on the Red Sea even there), gradually leads the line of Cronus southward through Peræa into Egypt. This line has decided Indo-European affinities in Ouranos, Atlas, Pontus, Nereus, Poseidon, Athene, Melcartus, &c. From a consideration of the evidence afforded in the traditions of the ancients, the Abbé Banier decides that Syria, Palestine, Arabia and Egypt, were the parts of the world first peopled, and from which civilization was diffused over the earth.[98] Plato, in his Epinomis, thus speaks of the origin of astronomical science: "The first who observed these things was a barbarian who lived in an ancient country, where, on account of the clearness of the summer season, they could first discern them; such are Egypt and Syria, where the stars are clearly seen, there being neither rains nor clouds to hinder their sight; and because we are more remote from this fine summer weather than the barbarians, we came later to the knowledge of those stars." [99] The following passage, from the Rev. W. B. Galloway's book on Egypt, coincides most thoroughly with what I have already stated in regard to the topography of the first mythical period: "The conflagration of Phæthon, divested of fable, is interpreted as that of Sodom by the author of an ancient poem ascribed to Tertullian; it is also regarded by the historians and philosophers of antiquity as a physical fact. Plato in his Timæus mentions that a venerable Egyptian priest told Solon so, though associating it with an erroneous physical theory. The Scholiast in the Timæus connects it with the mention of the flood of Ogyges and Deucalion, and with the period of the latter; and he informs us that the conflagration was in Ethiopia, which we may construe vaguely as some part of the subject territory of Cush, who in early times may be viewed as claiming patriarchal supremacy over all the tribes of Ham, and thus over Canaan.[100] Even Egypt was called Ethiopia and Ogygia, as we learn from Eustathius. Julius Africanus gives the same general designation of the locality; and he too associates it with the period

[98] Banier, i., 45.

[99] Costard, History of Astronomy, p. 113.

[100] Mr. Galloway must have forgotten the fact that Ethiopia and Southern Palestine are confounded in ancient story, as in the case of Cepheus, king of Ethiopia, whom we have the authority of Strabo, Mela, and other geographers, for making king of Joppa and the surrounding country.

of a flood, indicating, but erroneously, that of Deucalion. On the authority of Acusilaus he puts Ogyges 1020 years before the first Olympiad, or equivalent to 1796 years before Christ; to which time he also refers the Exodus of Israel, much too early a date for the latter event, perhaps not early enough for the flood of Ogyges, but which would place it during the residence of the Israelites in Egypt, 255 years before the Exodus. Ogyges, who afterwards founded Eleusis, is said by Thallus to have been of the race of giants who warred against heaven; and, being defeated, he fled as an emigrant *from Phœnicia* to the land then called Acte, but since Attica. The flood which happened in his day through the overflowing of a river, may, therefore, have been not in Greece, but in the country from which he emigrated thither. The Scholiast on Plato does not say that it was in Greece, but only that Ogyges was king of Attica. In the Latin of the Chronicus Canon of Eusebius we accordingly find it mentioned thus: "Diluvium Egypti hoc tempore fuit, quod factum est sub Ogyge."[101] More probably it was in Canaan than in Egypt, though known to the Egyptians;[102] and it is not unlikely that the flow of the waters of the Jordan, which must necessarily have preceded the bursting in and final settling down of the basin of the Dead Sea to its present form, meets us in this tradition, which has since become transferred to Greece, partly from the emigration of Ogyges thither, and also partly from its having become confounded with a later flood. Ptolemy the geographer informs us that near the Climax, an ascent or hill in or near the Idumean range, there was a spring having Avernian associations, for it was called "the Stygian fountain." Apollodorus makes Phæthon a native of Syria and son of Tithonus (who has Egyptian, and Assyrian, and Persian connections). Ovid, who seems in some things to have taken his materials from Acusilaus, in others doubtless from a variety of other ancient writers of history genuine or traditionary, makes him contemporary with Epaphus, and he glances at the existence of a wide-spread inundation, or sea of collected waters, at or just following the period of the conflagration of Phæthon, and at the spot where the earth sank down to a lower level. Clement of Alexandria puts the conflagration in the time of Crotopus. Johannes Antiochenus

101 "The Egyptian deluge was at this time, which took place under Ogyges."

102 There is every reason to believe that the plutonic agency at work in the lower basin of the Jordan was of a wide-spread character, and materially altered the face of the country towards the shores of the Red Sea, and probably eastward towards Egypt.

connects it with the story of the giants (Titans as Thallus calls them), but throws it back towards the flood, and he places it on the river Eridanus, but he does not understand the right Eridanus, the Jordan. The Titans are mentioned in Phœnician history as a race of men who lived by agriculture and hunting. The name Ogyges, as connected with the Titans or giants, may itself be suggestive of the neighbourhood of the Jordan, where, at a later period, the last survivor of the remnant of the giants bore the name of Ὤγ, γίγας, "Og, the giant,"[103] (the spelling γύγης survives only as a proper name of one of the giant race)."[104] Minos, the first great lawgiver of Greece, is frequently called a Phœnician, while his descent from Cadmus through Europa (Cadmus being placed midway between Egypt and Phœnicia), and the presence of his name in Minois near Gaza, which is the border of the Chereth-ites or Cretans, completely identify him with Palestine. We have the authority of Pausanias for stating that the Hebrews shewed the grave of Silenus, and that statues of him were dug up in Palestine;[105] and that of Pliny to the fact that the nurse of Bacchus was buried at Beth-shan or Scythopolis.[106] As interesting as these is the tradition that Feridun of Persia, who lived a considerable time after the great destruction that preceded the reign of Gilshah or Ubul Muluk, founded Jerusalem in 1729 B.C.[107] "Gentile and Jewish records," says Dean Stanley, "combine in placing the earliest records of Phœnician civilization by the Assyrian lake" (the Dead Sea).[108] The Hycsos or shepherd line of Egypt, who are made the authors of civilization, are invariably derived from Phœnicia, Philistia and the borders of Palestine and Arabia, to which region they are in part supposed to have returned. The name "Phœnician pastors" is the one by which they are most frequently designated.

The extracts and references given above tend to prove two things: first, that the primitive civilization, of which records remain, is to be found in the southern part of Palestine, whence it extended south-westward into Egypt; and second, that this primitive civilization was the work of a very mixed people, known as Phœnicians. I call the

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[103] The name of Agag, common to the Amalekite kings of that region, who are numbere among the invaders of Egypt, comes nearer still.

[104] Galloway, Egypt's Record, p. 463.

[105] Pausanii Geog., vi., 24, 6.

[106] Plinii, H. N., v., 16.

[107] Dabistan, i., 50.

[108] Stanley, Sinai and Palestine, 28

Phœnicians a very mixed people, although it has been customary to call them pure Hamites, and to accept the statement of Augustine that they descended from Canaan,[109] because the evidence of Semitic, and especially of Indo-European elements, in their persons, language and civilization, is diametrically opposed to any such notion. As well might we conclude, because the inhabitants of England are called Britons, that their physical conformation, character, language, civilization, etc., are Celtic. The following passage from Lenormant and Chevalier's Manual must be read *cum grano salis*, the *granum* being a wholesome ignoring of all such ethnic terms as Canaanite, Cushite, Semitic, Japetic. It will then simply indicate that a people who once dwelt in the eastern part of Southern Palestine, at a subsequent period migrated to Phœnicia. "The traditions of the Phœnicians collected at Tyre itself by Herodotus, ever careful and intelligent in the choice of his sources of information, and also accepted by the judicious Trogus Pompeius; those of the inhabitants of Southern Arabia preserved by Strabo; and finally those still current in Babylonia during the first centuries of the Christian era, when the Syro-Chaldee original of the book of Nabathæan Agriculture was revised—all agree in stating that the Canaanites (Phœnicians) at first lived near the Cushites, on the banks of the Erythræan Sea or Persian Gulf, on that portion of the coast of Bahrein designated El Katif on our modern maps of Arabia. Pliny speaks of a land of Canaan, in this neighbourhood, in his time. Strabo speaks of the "Islands of Tyre and Aradus," the Bahrein Isles of our day, containing temples similar to those of the Phœnicians; "and," he adds, "if we may believe the inhabitants, the islands and the town of the same name in Phœnicia are their own colonies." According to Trogus Pompeius, the Canaanites (Phœnicians) were driven from their first settlements by earthquakes, and then journeyed (northwards) towards Southern Syria. The traditions preserved in "Nabathæan Agriculture" state, on the contrary, that they were violently expelled, in consequence of a quarrel with the Cushite (?) monarchs of Babylon of the dynasty of Nimrod; and this is also the account given by the Arabian historians, who have recorded very precisely the traditions as to the migration of the Canaanites, whom they term the original Amalekites, descendants of Ham, carefully distinguishing them from the second, the Biblical Amalekites, of Semitic race.[110] One branch of

[109] Lenormant and Chevalier, ii., 144.
[110] Id.

the great Phœnician stock, according to Dr. Movers,[111] is the nation of the Philistines, and of them I cannot forbear quoting Hitzig's decided language, "Ich habe gefunden: die Philistäer sind keine Semiten, sondern pelasgischen Stammes; und ihre Sprache war deren spärliche Ueberreste, meist Eigennamen, darthun, mit dem Sanskrit und dem Griechischen verwandt."[112] It is not a little remarkable that the first state we hear of after the destruction of the cities of the plain is that of Abimelech, king of the Philistines of Gerar, who bordered closely upon the Amalekites.[113] These Philistines, who are shown from the names Phicol, Ahuzzath, Gerar, etc., to have been of the Indo-European or Japhetic family, like the Phœnician pastors of Egypt,[114] were in a favourable position for invading that country, as the Arabian tradition charges them with doing;[115] being situated just midway between the old home on the Jordan, whence earthquake and flood expelled them, and the coveted wealth of the Nile valley. A striking coincidence appears in the earliest history of Persia, which has links to bind it with that of almost every other people, and especially with the histories of Egypt, India, Chaldea and Arabia. The first Iranian king, after the great destruction of mankind, which came upon them on account of their wickedness, was Gilshah or Kaiomers, whom the Arabs call Ubul-Muluk, or the Father of Kings.[116] His grandson Houcheng, or Pischdad, connects by the first name with the Indian Vichnou, and by the second, removing the mere prefix of the Coptic article (Pi), with the Arab Shedad, which is identical with the Welsh Seithwedd, the Indian Soutadanna, the Egyptian (Fo)stat, the Philistine Ashdod, and the Athenian Astu or Fastu.[116*] The legend connected with this name is invariably that of a flood. The son of Houcheng, again, is Tahmouras, who is thoroughly identified with Demarous, or Demaroon, of Phœnicia, and Demophoon of the Greek story.[117] This latter

111 Movers die Phœnizier, i., p. 1, &c.

112 "I have found it: the Philistines are no Semites, but of a Pelasgian stock, and their language, as the slender remains, mostly of proper names, prove, was related to the Sanskrit and the Greek."

113 Genesis, xx., xxvi.

114 Hitzig, die Philistäer, 77, 119, 294, &c.

115 Ritter, Comp. Geog. of Pal., iii., 269. Sale's Koran (Preliminary Discourse, Section 1).

116 Russell's Connection, ii., 28, 31. 116* Diod. Sic. i., 16.

117 This connection appears in Dewbund (demon destroyer), a name of Tahmouras. Demophoon is a word like Bellerophon. Movers (die Phœnizier, 661, &c.) connects Demarous (Demaroon) with the river Damouras or Tamyras, in Phœnicia, and thus with Tamyras of Cyprus. Tahmouras, like Tamyras, is the sun. As Demarous is the father of Melcartus, so Tahmouras is father of Djemschid. As Demaroon is adopted son of Dagon, so is Tahmouras the

name, as well as the Dagon connection of Houcheng, Vichnou, Shedad, Ashdod, etc., give us families whose history is connected with that of Ceres, which forms one of the earliest of ancient traditions. Eleusis, the abode of Demophoon, Celeus, his supposed father, Elysium of the Greeks and Latins, Kailasa of the Hindoos, and Gilshah of the Persians, with many similar names, meet in Elusa or Khulasa (according as the breathing is absent or present), which is a town and region in Gerar. Near at hand is Aroer, whence came one of the Ceres line, Erechtheus of Aroura. There, indeed, sprang into existence the Aryan race, as a race of husbandmen. Not far off, towards the Mediterranean, is Jenysus, which is so thoroughly identified with the Nyssa in which Bacchus was born, and from which Proserpine was carried away.[118] Space will not permit me to enlarge further upon this most interesting subject. Enough has been said to indicate, if not to prove true, my belief (the proof is yet to come in future papers), that the morning of History rose in the south of Palestine, whence it passed to a brighter Egyptian day; and that the "Myths of the Dawn" may all be transmuted into genuine narratives of facts by a careful comparison of them one with the other, with the region specified, and with undoubted history, Biblical and Monumental.

Let the "single community and place" of Faber be the Egyptian Empire at its largest extent, when no civilized nation was known to exist beyond its bounds. These were marked on the north by Mount Amanus; on the east by the Euphrates and Tigris and the Persian Gulf; on the south by the limits of Arabia Felix and Ethiopia; and on the west by the Sahara and the Mediterranean. Europe was a desert wilderness, peopled, perhaps, after the manner of the American continent, when first discovered; and the greater part of Asia was in the same condition. When did the nations who received their schooling within the limits mentioned go forth into the world beyond, to give to history the unmistakable record of a distinct national life in Persia and Asia Minor, Greece, and the Islands, Rome and Carthage, and the later seats of empire in the north and west? This question may be difficult to answer with exactness; but monumental evidence exists to show that as late as the date of the Exodus (1491 B.C.), the

son of Houcheng or Pischdad, and Demophoon of Celeus (Khulasa), the favourite of Ceres. There is a Wady Taamirah running from Bethlehem (the house of bread) to the Dead Sea. Ritter's Comp. Geog., iii., 135. The Demo or Dema in the above names suggest of themselves a connection with Demeter, Damithales, Demo, Damia, &c. Guigniaut, iii., 616.

[118] Guigniaut, iii., 67. Diod. Sic. i., 8, iii., 34, &c.

bounds specified were not exceeded. There is also decided evidence to the fact that, with Egyptians, Ethiopians, Libyans, Chaldæans, Arabians, Phœnicians and Syrians, whose respective countries fall within these limits, there then dwelt Persians and Indians; Lydians, Cappadocians, Phrygians and other peoples, who afterwards colonized Asia Minor; Greeks and Italians; Moors and Carthaginians; as well as the ancestors of the German and Celtic peoples.[11] During the long period lying between the Dispersion of Babel and the Exodus of Israel, the common literature, religion, art, language—the common civilization, in fact,—of the world had time to develope itself in Egypt and the adjacent countries. Egypt was the cradle of civilization, not the teacher, but the school of the whole world. Of humanity, as of humanity's divine representative, the saying of the Father is true, "Out of Egypt have I called my son."[120]

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[119] Lenormant and Chevalier, i., 246, 249, 255, 259, 260, &c.

[120] Hosea, xi., 1. Matthew, ii., 15.

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

(Continued from Vol. XIII., p. 112.)

BY THE REV. DR. SCADDING.

XLI.—QUEEN STREET—FROM BROCK STREET TO BATHURST STREET.

The first occupant of the next lot (No. 16) westward was Mr. Baby, of whom we have spoken in former sections. Opposite was the home of Bernard Turquand, an Englishman of of note, for many years first clerk in the Receiver General's department. He was an early promoter of amateur boating amongst us, a recreation with which possibly he had become familiar at Malta, where he was long a resident. Just beyond, and on the same side, was the dwelling-place of Major Winniett,—a long, low, one-storey bungalow, of a neutral tint in colour, its roof spreading out, verandah-wise, on both sides.

After the name of Mr. Baby, on the early plan of the park-lots, comes the name of Mr. Grant—"the Hon. Alexander Grant." During the interregnum between the death of Governor Hunter and the arrival of Governor Gore, Mr. Grant, as senior member of the Executive Council, was President of Upper Canada. The Parliament that sat during his brief administration, appropriated £800 to the purchase of instruments for illustrating the principles of Natural Philosophy, "to be deposited in the hands of a person employed in the Education of Youth;" from the debris of which collection, preserved in a mutilated condition in one of the rooms of the Home District School building, we ourselves, like others probably of our contemporaries, obtained our very earliest inkling of the existence and significance of scientific apparatus. In his speech at the close of the session of 1806, President Grant alluded to this action of Parliament in the following terms: "The encouragement which you have given for procuring of the means necessary for communicating of useful and ornamental knowledge to the rising generation, meets with my approbation, and, I have no doubt, will produce the most salutary effects." Mr. Grant was also known as Commodore Grant, having had, at one time, command of the Naval Force on the Lakes.

After Mr. Grant's name appears that of "E. B. Littlehales." This is the Major Littlehales with whom those who familiarize themseves with the earliest records of Upper Canada become so well acquainted. He was the writer, for example, of the interesting Journal of an Exploring Excursion from Niagara to Detroit in 1793, to be seen in print in the *Canadian Literary Magazine* of May, 1834; an expedition undertaken, as the document itself sets forth, by the Lieut. Governor, accompanied by Captain Fitzgerald, Lieutenant Smith of the 5th Regiment, and Lieutenants Talbot, Grey and Givins, and Major Littlehales, starting from Niagara on the 4t of February, arriving at Detroit on the 18th, by a route which was 270 miles in length. The return began on the 23rd, and was completed on the 10th of the following month. It was in this expedition that the site of London, on the Thames, was first examined, and judged to be "a situation eminently calculated for the metropolis of all Canada." "Among other essentials," says Major Littlehales, "it possesses the following advantages: command of territory,—internal situation,—central position,—facility of water-communication up and down the Thames into Lakes St. Clair, Erie, Huron, and Superior,—navigable for boats to near its source, and for small craft probably to the Moravian settlement,—to the southward by a small portage to the waters flowing into Lake Huron—to the south-east by a carrying-place into Lake Ontario and the River St. Lawrence; the soil luxuriantly fertile,—the land rich and capable of being easily cleared, and soon put into a state of agriculture,—a pinery upon an adjacent high knoll, and other timber on the heights, well calculated for the erection of public buildings,—a climate not inferior to any part of Canada." The intention of the Governor, at one time, was that the

future capital should be named GEORGINA, in compliment to George III. Had that intention been adhered to, posterity would have been saved some confusion. To this hour, the name of our Canadian London gives trouble in the post-office and elsewhere. Georgina was a name not inaptly conceived, suggested doubtless by the title "Augusta," borne by so many places of old, as, for example, by London itself, the Veritable, in honour of the Augustus, the Emperor of the day. We might perhaps have rather expected Georgiana, on the analogy of Aureliana (Orleans), from Aurelius, or Georgia, after Julia, a frequent local appellation from the imperial Julius.—Already, in a preceding reign, had Georgius yielded Georgia as the name of a province, and more recently, Herschel's *Georgium sidus*, rather elegantly imitative of Horace's *Julium sidus*.—We presume, also, that the large subdivision of Lake Huron, known as the Georgian Bay, had a like loyal origin for its name.

An incident not recorded in Major Littlehales' Journal was the order of a grand parade (of ten men), and a formal discharge of musketry, issued in jocose mood by the Governor to Lieut. Givins; which was duly executed as a ceremony of inauguration for the new capital.—The name Georgina, which probably originated on this occasion, is preserved in that of the now flourishing township of Georgina on Lake Simcoe. An adventure, however, in which Lieut. Givins' name appears, is recorded by Major Littlehales, as taking place at this time, in the following terms: "The young Indians who had chased a herd of deer in company with Lieut. Givins," he says, "returned unsuccessful, but brought with them a large porcupine; which was very seasonable," he remarks, "as our provisions were nearly exhausted. This animal," he observes, "afforded us a good repast, and tasted like a pig." The Newfoundland dog, he continues, attempted to bite the porcupine, but soon got his mouth filled with the barbed quills, which gave him exquisite pain. An Indian undertook to extract them, Major Littlehales says, and with much perseverance plucked them out, one by one, and carefully applied a root or decoction, which speedily healed the wound. From Major Littlehales' journal it appears that it was the practice of the party to wind up each day's proceedings by singing "God save the King." Thus on the 28th Feb., before arriving at the site of London, we have it recorded: "At six we stopped at an old Mississagua hut, upon the south side of the Thames. After taking some refreshment of salt pork and venison, well-cooked by Lieutenant Smith, who superintended that department, we, as usual, sang God save the King, and went to rest." The Duke de Liancourt, in his *Travels in North America*, speaks of Major Littlehales in the following pleasant terms: "Before I close the article of Niagara," he says, "I must make particular mention of the civility shewn us by Major Littlehales, adjutant and first secretary to the Governor, a well-bred, mild and amiable man, who has the charge of the whole correspondence of government, and acquits himself with peculiar ability and application. Major Littlehales," the Duke says, "appeared to possess the confidence of the country. This is not unfrequently the case with men in place and power; but his worth, politeness, prudence, and judgment, give this officer peculiar claims to the confidence and respect which he universally enjoys."

In the *Oracle* of Feb. 24, 1798, a report of the death of this officer is contradicted. "We have the pleasure of declaring the account received in December last of the death of Col. Littlehales premature. Letters have been recently received from him dated in England." He had probably returned home with Gen. Simcoe. In the same paper a flying rumour is noticed, to the effect "that His Excellency Governor Simcoe is appointed Governor General of the Canadas."

Major Littlehales' park-lot became subsequently the property of Capt. John Denison, and from him descended to his heir Col. George Taylor Denison, from whom the street now passing from south to north has its name, Denison Avenue. This thoroughfare was, in the first instance, the drive up to the homestead of the estate, Bellevue, a large white cheery-looking abode, lying far back but pleasantly visible from Lot Street through a long vista of overhanging trees.—From the old Bellevue has spread populous colonies at Dovercourt, Rusholme and elsewhere, marked, like their progenitor, with vigour of character, and evincing in a succession of instances strong aptitude for military affairs. Col. Denison's grandson, G. T. Denison *tertius*, is the author of a work on "Modern Cavalry, its Organisation, Armament and Employment in War," which has taken a recognized place in English stratagetical literature.

In accordance with an early Canadian practice, Capt. John Denison set apart on his property a plot of ground as a receptacle for the mortal remains of himself and his descendants. The

place selected for this purpose was a picturesque spot on land possessed by him on the Humber river, entailing at the same time the surrounding property. In 1853,—although at that date an act of parliament had cancelled entails,—his heir, Col. G. T. Denison, *primus*, connected the land referred to together with the burial plot, perpetually with his family and descendants, by converting it into an endowment for an ecclesiastical living, to be always in the gift of the legal representative of his name. This is the projected rectory of St. John's on the Humber. In 1857, a son of Col. Denison's, Robert Britton Denison, erected at his own cost, in immediate proximity to the old Bellevue homestead, the church of St. Stephen, and took steps to make it in perpetuity a recognized ecclesiastical benefice.

The boundary of Major Littlehales' lot westward was near what is now Bathurst Street. In front of this lot, on the south side of Lot Street, and stretching far to the west, was the Government Common, of which we have previously spoken, on which was traced out, at first ideally, and at length in reality, the arc of a circle of 1,000 yards' radius, having the Garrison as its centre. Southward of the concave side of this arc no buildings were for a long time permitted to be erected. This gave rise to a curiously-shaped enclosure, northward of St. Andrew's Market-house, wide towards the east, but vanishing off to nothing on the west, at the point where Lot Street formed a tangent with the military circle.

Of Portland Street and Bathurst Street we have already spoken in our survey of Front Street. Immediately opposite Portland Street was the abode, at the latter period of his life, of Dr. Lee, to whom we have referred in our accounts of Front and George Streets. Glancing northward as we pass Bathurst Street, which, by the way, north of Lot Street, was long known as Crookshank's Lane, we are reminded again of Mr. Murchison, whom we have likewise briefly commemorated elsewhere. The substantial abode to which he retired after acquiring a good competency, and where in 1870 he died, is to be seen on the east side of Bathurst Street.

XLII.—QUEEN STREET—FROM BATHURST STREET TO THE ASYLUM.

The names which appear in the early plans of York and its suburbs, as the first possessors of the park lots westward of Major Littlehales', are, in order of succession, respectively, Col. David Shank, Capt. McDonell, Capt. S. Smith, Capt. Æ. Shaw, Capt. Bouchette. We then arrive at the line of the present Dundas road, where it passes at right angles north from the line of Queen Street. This thoroughfare is not laid down in the plans. Then follow the names of David Burns, William Chewett and Alexander MacNab (conjointly), Thomas Ridout and William Allan (conjointly), and Angus Macdonell. We then reach a road duly marked, leading straight down to the French Fort, Fort Rouillé, commonly known as Fort Toronto. Across this road westward, only one lot is laid off, and on it is the name of Benjamin Hallowell.

Most of the names first enumerated are very familiar to those whose recollections embrace the period to which our attention is now being directed. Many of them have occurred again and again in these papers.

In regard to Col. David Shank, the first occupant of the park lot westward of Major Littlehales', we must content ourselves with some brief "collections." In the Simcoe correspondence, preserved at Ottawa, there is an interesting mention of him, associated, as it appropriately happens, with his neighbour-locatees to the east and west here on Lot Street. In a private letter to the "Secretary of War," Sir George Yonge, from Governor Simcoe, dated Jan. 17th, 1792, announcing his arrival at Montreal, *en route* for the new Government, still far up "the most august of rivers," Capt. Shank is spoken of as being on his way to the same destination in command of a portion of the Queen's Rangers, in company with Capt. Smith. There is noted in the same document, it will be observed, a gallant achievement of Capt. Shaw's, who, the Governor reports, had just successfully marched with his division of the same regiment all the way from New Brunswick to Montreal, in the depth of winter, on snow-shoes. "It is with infinite pleasure," writes Governor Simcoe to Sir George Yonge, "that I received your letter of the 1st of April by Capt. Littlehales. On the 13th of June," he continues, "that officer overtook me on the St. Lawrence, as I was on my passage in batteaux up the most august of rivers. It has given me great satisfaction," the Governor says, "that the Queen's Rangers have arrived so early. Capt. Shaw, who crossed in the depth of winter on snow-shoes from New Brunswick, is now at Kingston with the troops of the two

first ships; and Captains Shank and Smith, with the remainder, are, I trust, at no great distance from this place,—as the wind has served for the last 36 hours, and I hope with sufficient force to enable them to pass the Rapids of the Richelieu, where they have been detained some days." Governor Simcoe himself, as we learn from this correspondence, had landed at Quebec on the 11th of November preceding (1791) in the "Triton," Capt. Murray, "after a blustering passage."

In addition to the lot immediately after Major Littlehales', Col. Shank also possessed another in this range, just beyond, viz., No. 21.

The Capt. McDonell, whose name appears on the lot that follows Col. Shank's first lot, was the aide-de-camp of Gen. Brock, who fell, with that general, at Queenston Heights. Capt. McDonell's lot was afterwards the property of Mr. Crookshank, from whom what is now Bathurst Street North had, as we have remarked, for a time the name of Crookshank's Lane.

Capt. S. Smith, whoso name follows those of Capt. McDonell and Col. Shank, was afterwards President Smith, of whom already. The park lot selected by him was subsequently the property of Mr. Duncan Cameron, a member of the Legislative Council, well-remembered. The southern half of this lot now forms the site and grounds of the University of Trinity College. At an early period, the whole property was known by the graceful appellation of Gore Vale. Gore was in honour of the Governor of that name. Vale denoted the ravine which indented a portion of the lot through whose meadow-land meandered a pleasant little stream. This brooklet will hereafter be famous in scholastic song. It will be regarded as the Cherwell of an infant Christ Church; the Cephissus of a Canadian Academus. It irrigates the elmy dale which gives such agreeable variety to the park of Trinity College, and which renders so charming the views from the Provost's Lodge. After the decease of Mr. Cameron, Gore Vale was long occupied by his excellent and benevolent sister, Miss Janet Cameron. We observe Mr. Cameron's name, in conjunction with that of Mr. Allan, attached to an advertisement calling for tenders for the erection of a Church in York in 1803. "Wanted: a Quantity of Pine, Boards, Scantling, Stones and Lime for building a Church in this Town. Any person inclined to furnish any of these articles, will please to give their proposals at the lowest prices, to the Subscribers, to be laid before the Committee. D. Cameron. W. Allan. York, 1st June, 1803."

Here we have the rudiments of St. James's Church, whose history we have already traced. In 1812, Mr. Cameron is churchwarden of the same church, with Mr. Alexander Legge as his colleague.

On the steep mound which overhangs the brook above mentioned, on its eastern side, just where it is crossed by Queen Street, was, at an early period, a Blockhouse commanding the western approach to York. On the old plans this military work is shown, as also a path leading to it across the Common from the Garrison, trodden often probably by the relief party of the guard that would be stationed there in anxious times.

In the valley of this stream a little farther to the west, on the opposite side of Queen Street, was a Brewery of local repute: it was a long, low-lying dingy-looking building of hewn logs: on the side towards the street a railed gangway led from the road to a door in its upper storey. Conspicuous on the hill above the valley on the western side was the house, also of hewn logs but cased over with clap-boards, of Mr. Farr, the proprietor of the brewery, a north-of-England man in appearance and aspect, as well as in staidness and shrewdness of character. His spare form and slightly crippled gait were everywhere familiarly recognized. Greatly respected, he was still surviving in 1871. His chief assistant in the old brewery bore the name of Bow-beer. (At Canterbury, we remember, many years ago, when the abbey of St. Augustine there, now a famous Missionary College, was a Brewery, on the beautiful turreted gateway, wherein were the "coolers," the inscription "Beer, Brewer" was conspicuous; the name of the brewer in occupation of the grand monastic ruin being Beer, a common name, sometimes given as Bere; but which in reality is Bear.)

The stream which is here crossed by Queen Street is the same that afterwards flows below the easternmost bastion of the Fort. A portion of the broken ground between Farr's and the Garrison was once designated by the local Government,—so far as an order in Council has force,—and permanently set apart, as a site for a Museum and Institute of Natural History and Philosophy, with Botanical and Zoological Gardens attached. The project, originated by

Dr. Dunlop, Dr. Rees and Mr. Fothergill, and patronized by successive Lieutenant-Governors, was probably too bold in its conception, and too advanced to be justly appreciated and earnestly taken up by a sufficient number of the contemporary public forty years ago. It consequently fell to the ground. It is to be regretted that, at all events, the land, for which an order in Council stands recorded, was not secured in perpetuity as a source of revenue for the promotion of Science. In the Canadian Institute we have the kind of Association which was designed by Drs. Dunlop and Rees and Mr. Fothergill, but minus the revenue which two or three building lots in a flourishing city would conveniently supply without wronging anyone.

Capt. Æneas Shaw, the original locatee of the park-lot next westward of Colonel Shank's second lot, was afterwards well known in Upper Canada as Major General Shaw. Like so many of our early men of note he was a Scotchman; a Shaw of Tordorach in Strathnairn. Possessed of great vigour and decision, his adopted country availed itself of his services in a civil as well as a military capacity, making him a member of the legislative and executive councils. The name by which his house and estate at this point were knowu, was Oakhill. The primitive domicile still exists and in 1871 is yet occupied by one of his many descendants, Capt. Alex. Shaw.

Of Col. Joseph Bouchette, whose name is read on the following allotment, we have had occasion already to speak. He was one of the many French Canadians of eminence who, in the early days, were distinguished for their chivalrous attachment to the cause and service of England. The successor of Col. Bouchette in the proprietorship of the park lot at which we have arrived, was Col. Givins.—He, as we have already seen, was one of the companions of Gov. Simcoe in the first explorations of Upper Canada. Before obtaining a commission in the army, he had been as a youth employed in the North West, and had acquired a familiar acquaintance with the Otchibway and Huron dialects. This acquisition rendered his services of especial value to the Government in its dealings with the native tribes, among whom also the mettle and ardor and energy of his own natural character gave him a powerful influence. At the express desire of Governor Simcoe he studied and mastered the dialects of the Six Nations, as well as those of the Otchibways and their Mississagua allies. We ourselves remember seeing a considerable body of Indian chiefs kept in order and good humour mainly through the tact exercised by Col. Givins. This was at a Council held in the garden at Government House some forty years since, and presided over by the then Lieut.-Governor Sir John Colborne.

Col. Givins was Superintendent of Indian Affairs down to the year 1842. In 1828 his name was connected with an incident that locally made a noise for a time. A committee of the House of Assembly, desiring to have his evidence and that of Col. Coffin, Adjutant General of Militia, in relation to a trespass by one Forsyth on Government property at the Falls of Niagara, commanded their presence at a certain day and hour. On referring to Sir Peregrine Maitland, the Lieutenant-Governor at the time, and also Commander-in-Chief of the Forces, permission to obey the mandate of the House was refused. Col. Givins and Col. Coffin were then arrested by the Sergeant-at-arms, after forcible entry effected at their respective domiciles, and were kept confined in the common gaol until the close of the session. The following is Col. Coffin's letter to Major Hillier, private secretary to the Governor, on the occasion:

"York, March 22nd, 1828.

"Sir,—I beg leave to request that you will state to the Lieutenant Governor that in obedience to the communication I received through you, that his Excellency could not give me permission to attend a Committee of the House of Assembly for the reasons therein stated, that I did not attend the said Committee, and that in consequence thereof, I have been committed this evening to the common gaol of the Home District, by order of the House of Assembly. I have therefore to pray that his Excellency will be pleased to direct that I may have the advice and assistance of the Crown Officers, to enable me to take such steps as I may be instructed on the occasion. I have the honour, &c., N. Coffin, Adj. Gen. of Militia."

No redress was to be had. The Executive Council reported in regard to this letter that upon mature consideration they could not advise that the Government should interfere to give any direction to the Crown Officers, as therein solicited. Sir Peregrine Maitland was removed from the Government in the same year. Sir George Murray, who in that year succeeded Mr. Huskis-

son as Colonial Secretary, severely censured him for the line of action adopted in relation to the Forsyth grievance. Colonels Givins and Coffin afterwards brought an action against the Speaker of the House for false imprisonment, but they did not recover: for the legality of the imprisonment, that is the right of the House to convict for what they had adjudged a contempt, was confirmed by the Court of King's Beach, by a solemn judgment rendered in another cause then pending, which involved the same question.

Although its hundred-acre domain is being rapidly narrowed and circumscribed by the encroachments of modern improvement, the old family abode of Col. Givins still stands, wearing at this day a look of peculiar calm and tranquillity, screened from the outer world by a dark grove of second-growth pine, and overshadowed by a number of acacias of unusual height and girth. Governor Gore and his lady, Mrs. Arabella Gore, were constant visitors at this house; and here to this day is preserved a very fine portrait, in oil, of that Governor. It will satisfy the ideal likely to be fashioned in the mind by the current traditions of this particular ruler of Upper Canada. In contour of countenance and in costume he is plainly of the type of the English country squire of a former day. He looks good humoured and shrewd; sturdy and self-willed; and fond of good cheer. The cavalier style adopted by him towards the local parliament was one of the seeds of trouble at a later date in the history of Upper Canada. "He would dismiss the rascals at once." Such was his determination on their coming to a vote adverse to his notions; and, scarcely like a Cromwell, but rather like a Louis XIV., though still not, as in the case of that monarch, with a riding-whip in his hand, but nevertheless, in the undress of the moment, he proceeded to carry out his hasty resolve. The entry of the incident in the Journals of the House is as follows: "On Monday, 7th April, at 11 o'clock a.m., before the minutes of the former day were read, and without any previous notice, the Commons, to the great surprise of all the members, were summoned to the bar of the Legislative Council, when his Excellency having assented, in his Majesty's name, to several bills, and reserved for his Majesty's pleasure the Bank bill, and another, to enable creditors to sue joint debtors separately, put an end to the session by the following speech:—"Honourable Gentlemen of the Legislative Council, and Gentlemen of the House of Assembly,—The session of the provincial legislature having been protracted by an unusual interruption of business at its commencement, your longer absence from your respective avocations must be too great a sacrifice for the objects which remain to occupy your attention. I have therefore come to close the session and permit you to return to your homes. In accepting, in the name of his Majesty, the supply for defraying the deficiency of the funds which have hitherto served to meet the charges of the administration of justice and support of the civil government of this province, I have great satisfaction in acknowledging the readiness manifested to meet this exigence."

Upper Canadadian society was, indeed, in an infant state; but the growing intelligence of many of its constituents, especially in the non-official ranks, rendered it unwise in rulers to push the feudal or paternal theory of government too far. The names of the majority in the particular division of the Lower House that brought on the sudden prorogation just described are the following:—McDonell, McMartin, Cameron, Jones, Howard, Casey, Robinson, Nellis, Secord, Nichol, Burwell, McCormack, Cornwall. Of the minority: Van Koughnet, Crystler, Fraser, Cotter, McNabb, Swayze, and Clench.

Six weeks after, Governor Gore was on his way to England, not recalled, as it would seem, but purposing to give an account of himself in his own person. He never returned. He is understood to have had a powerful friend at Court in the person of the Marquis of Camden.

In the account which we gave of some of the early York elections, a spirited address of Judge Thorpe's will be remembered. The independent course pursued by that gentleman, when elected, excited the ire of the lieutenant-governor and his docile executive; and the colonial minister of the day was induced to remove him from the Bench. On Governor Gore's second and final visit to England, some expressions of his gave rise to an action for libel on the part of Mr. Thorpe, the result of which was an award of damages for the plaintiff.

One of the "districts" of Upper Canada was called after Governor Gore. It was set off, during his régime, from the Home and Niagara districts. But of late years country names have rendered the old district names unfamiliar. In 1837, "the men of Gore" was a phrase invested with stirring associations.

The town of Belleville received its name from Gov. Gore. In early newspapers and other documents the word appears as Bellville, without the central *e*, which gives it now such a fine French look. And this, it is said, is the true orthography. "Bell," we are told, was the Governor's familiar abbreviation of his wife's name, Arabella: and the compound was suggested by the Governor jocosely as a name for the new village: but it was set down in earnest, and has continued, the sound at least, to this day. This off-hand assignment of a local name may remind some persons that Flos, Tay, and Tiny, which are names of three now populous townships in the Penetanguishene region, are a commemoration of three of Lady Sarah Maitland's lap-dogs. Changes of names in such cases as these are not unjustifiable.

In fact, the Executive Council itself, at the period of which we are speaking, had occasionally found it proper to change local names that had been frivolously given. In the *Upper Canada Gazette* of March 11th, 1822, we have several such alterations. It would seem that some one having access to the map or plan of a newly surveyed region, had inscribed across the parallelograms betokening townships a fragment of a well-known Latin sentence, "*jus et norma*," placing each separate word in a separate compartment. In this way Upper Canada had for a time a township of "Jus," and more wonderful still, a township of "Et." In the number of the *Gazette* of the date given above these names are formally changed to Barrie and Palmerston respectively. In the same advertisement, "Norma," which might have passed, is made "Clarendon." Other impertinent appellations are also at the same time changed. The township of "Yea" is ordered to be hereafter the township of "Burleigh," with a humorous allusion to the famous nod, probably. The township of "No" is to be the township of Grimsthorpe; and the township of "Aye," the township of Anglesea. The name "Et" may recall the street known as "Of" alley, on the south side of the Strand, in London, which "Of" is a portion of the name and title "George Villiers, Duke of Buckingham," distributed severally among a cluster of streets in that locality.

Gov. Gore was so fortunate as to be away from his Province during the whole of the war of 1812-13. He obtained leave of absence to visit England in 1811, and returned to his post in 1815, the Presidents, Isaac Brock, Roger Hale Sheaffe, and Gordon Drummond, Esquires, reigning in the interim.

Under date of York U. C., Sep. 30, 1815, we read the following particulars in the *Gazette* of the day:—"Arrived on Monday last, the 25th instant, His Excellency Francis Gore, Esq., Lieutenant Governor of the Province of Upper Canada, to reassume the reins of government. His Excellency was received with a cordial welcome and the honours due to his rank; and was saluted by his M. S. Montreal, and Garrison." We are also informed that "On Wednesday the 27th instant, he was waited on by a deputation, and presented with the following address, To His Excellency, Francis Gore, Esq., Lieutenant Governor of the Province of Upper Canada, &c., &c., &c. We, the Judges, Magistrates and principal Inhabitants of the Town of York, in approaching your Excellency to express our great satisfaction at beholding you once more among us, feel that we have still greater reason to congratulate ourselves on this happy event. Our experience of your past firm and liberal administration, by which the prosperity of the Province has been so essentially promoted, teaches us to anticipate the greater benefit from its resumption; and this pleasing anticipation is confirmed by our knowledge of that paternal solicitude which induced you while in England to bring, upon all proper occasions, the interests of the Colony under the favourable attention of His Majesty's Government; a solicitude which calls forth in our hearts the most grateful emotions. We rejoice that the blessings of peace are to be dispensed by one who is so well acquainted with the wants and feelings of the Colony; and we flatter ourselves that York, recovering from a state of war, (during which she has been twice in the power of the enemy,) will not only forget her disasters, but rise to greater prosperity under your Excellency's auspicious administration. York, September 27th, 1815. Thos. Scott, C.J., W. Dummer Powell, John Strachan, D.D., John McGill, John Beikie, M.P., Grant Powell, J.P., W. Chewett, J.P., J. G. Chewett, W. Lee, Sam. Smith, W. Claus, Benjamin Gale, D. Cameron, D. Boulton, jun., George Ridout, And. Mercer, Thomas Ridout, J.P., W. Jarvis, Sec. and Reg., S. Jarvis, J. P., John Small, J.P., W. Allan, J.P., J. Givins, E. MacMahon, J. Scarlett, S. Heward, Thos. Hamilton, C. Baynes, John Dennis, P. K. Hartney, Jno. Cameron, E. W. McBride, Jordan Post, jun., W. Knott, jun., Levi Bigelow, John Hays, T. R. Johnson, Lardner Bostwick, John Burke, John Jordan, W. Smith, sen., W. Smith, jun., J. Cawthra,

John Smith, Alex. Legge, Jordan Post, sen., Andrew O'Keefe, S. A. Lumsden, John Murchison, Thomas Deary, Ezek. Benson, A. McNabb, Edward Wright, John Evans, W. Lawrence, Thos. Duggan, George Duggan, Benjamin Cozens, Philip Clinger and Sheriff Ridout. To which His Excellency was pleased to make the following answer: Gentlemen: After so long an absence from this place it is particularly gratifying to find the same sentiments of cordiality to me, and of approbation of my conduct, which I experienced during my former residence in this Province. It is but doing me justice to say that, while in Europe, I paid every attention in my power to promote your prosperity; and such, you may be assured, shall be my future endeavour when residing amongst you; earnestly hoping that, under the fostering care of our Parent State, and under that security which Peace alone can bestow, this Colony will speedily become a valuable, though distant part of the British Empire. York, 27th September, 1815." Under date of Oct. 7th following it is announced that "His Royal Highness, the Prince Regent acting in the name and on the behalf of His Majesty, has been pleased to appoint Thomas Fraser, Esquire, of Prescott, Neil McLean, Esquire, of Cornwall, Thomas Clark, Esquire, of Queenston, and William Dickson, Esquire, of Niagara, to be members of the Legislative Council; Samuel Smith, Esquire, of Etobicoke, to be a member of the Executive Council, and Doctor John Strachan, to be an Honorary Member of the same Council."

By one of the acts passed during the administration of Gov. Gore, the foundation was laid of a parliamentary library, to replace the one destroyed or dispersed during the occupation of York in 1813. In the session of 1816 the sum of £800 was voted for the purchase of books for the use of the Legislative Council and House of Assembly. The sum of £800 for such a purpose contrasts poorly, however, with the £3,000 recommended in the same session to be granted to Gov. Gore himself for the purchase of "Plate." The joint address of both Houses to the Prince Regent, on this subject, was couched in the following terms: "To his Royal Highness, George, Prince of Wales, Prince Regent of the United Kingdom of Great Britain and Ireland, &c., &c., &c.: May it please your Royal Highness: We, his Majesty's most dutiful and loyal subjects, the Legislative Council and House of Assembly of the Province of Upper Canada, in Provincial Parliament assembled, impressed with a lively sense of the firm, upright, and liberal administration of Francis Gore, Esq., Lieutenant-Governor of this Province, as well as of his unceasing attention to the individual and general interests of the colony during his absence, have unanimously passed a bill to appropriate the sum of three thousand pounds to enable him to purchase a service of plate, commemorative of our gratitude. Apprized that this spontaneous gift cannot receive the sanction of our beloved Sovereign in the ordinary mode, by the acceptance of the Lieutenant-Governor in his name and behalf, we, the Legislative Council and Assembly of the Province of Upper Canada, humbly beg leave to approach your Royal Highness with an earnest prayer that you will approve this demonstration of our gratitude, and graciously be pleased to sanction, in his Majesty's name, the grant of the Legislature in behalf of the inhabitants of Upper Canada. Wm. Dummer Powell, Speaker, Legislative Council Chamber, 26th March, 1816. Allan Maclean, Speaker, Commons House of Assembly, 25th March, 1816." To which, as we are next informed, his Excellency replied: "Gentleman: I shall transmit your address to his Majesty's Minister, in order that this expression of your approbation of my past administration may be laid at the feet of his Royal Highness, the Prince Regent. Government House, York, 26th March, 1816." The Bill which suggested this allowance was popularly spoken of as the "Spoon-bill." The House that passed the measure was the same that, a few weeks later, was so abruptly dismissed.

XIII.—QUEEN STREET—FROM THE ASYLUM WESTWARD.

The name on the allotment following that occupied successively by Col. Bouchette and Col. Givins is "David Burns." Mr. Burns, who had been a Navy surgeon, was the first Clerk of the Crown for Upper Canada, and one of the "Masters in Chancery." He died in 1806. In the *Oracle* of Saturday, Feb. 15, in that year, we have verses to the memory of the late David Burns, Esq. We make the following extract, which is suggestive:—

> "Say, power of Truth, so great, so unconfined,
> And solve the doubt which so distracts my mind—
> Why Strength to Weakness is so near allied?
> Perhaps 'tis given to humble human pride.

At times perchance frail Nature held the sway,
Yet dimm'd not it the intellectual ray :
Reason and Truth triumphant held their course,
And list'ning hearers felt conviction's force :
No precept mangled, text misunderstood,
He thought and acted but for public good :
His reasoning pure, his mind all manly light,
Made day of that which else appear'd as night.
In him instruction aim'd at this great end—
Our fates to soften and our lives amend.
Yet he was man, and man 's the child of woe,
Who seeks perfection. seeks not here below."

Of Col. W. Chewett, whose name appears next, we have made mention more than once. His name, like that of his son, J. G. Chewett, is very familiar to those who have to examine the plans and charts connected with early Upper Canadian history. Both were long distinguished *attachés* of the Surveyor-General's department. In 1802, Col. W. Chewett was Registrar of the Home District.

Alexander Macnab, whose name occurs next in succession, was afterwards Capt. Macnab. who fell at Waterloo, the only instance, as is supposed, of a Canadian slain on that occasion, In 1868, his nephew, the Rev. Dr. Macnab, of Bowmanville, was presented by the Duke of Cambridge in person with the Waterloo medal due to the family of Capt. Macnab.

Alexander Macnab was also the first patentee of the first plot of ground whereon stands the house on Bay Street noted, in our account of the early press, as being the place of publication of the Upper Canada *Gazette* at the time of the taking of York, and subsequently owned and occupied by Mr. Andrew Mercer up to the time of his decease in 1871.

Of Messrs. Ridout and Allan, whose names are inscribed conjointly on the following park lot, we have already spoken ; and Angus Macdonell, who took up the next lot, was the barrister who perished, along with the whole court, in the Speedy

The name that appears on the westernmost lot of the range along which we have been passing is that of Benjamin Hallowell. He was a near connection of Chief Justice Elmsley's, and father of the Admiral, Sir Benjamin Hallowell, K.C.B. We observe the notice of Mr. Hallowell's death in the *Gazette and Oracle* of the day, in the following terms : "Died, on Thursday last (in March 28th, 1799), Benjamin Hallowell, Esq., in the 75th year of his age. The funeral will be on Tuesday next, and will proceed from the house of the Chief Justice to he Garrison Burying Ground at one o'clock precisely. The attendance of his friends is requested."

Associated at a later period with the memories of this locality is the name of Col. Walter O'Hara.—In 1808 an immense enthusiasm sprang up in England in behalf of the Spaniards, who were beginning to rise in spirited style against the domination of Napoleon and his family. Walter Savage Landor, for one, the distinguished scholar, philosopher and poet, determined to assist them in person as a volunteer. In a letter to Southey, in August, 1808, he says : "At Brighton, I preached a crusade to two auditors : *i. e.*, a crusade against the French in Spain : Inclination, he continues, was not wanting, and in a few minutes everything was fixed." The two auditors, we are afterwards told, were both Irishmen, an O'Hara and a Fitzgerald. Landor did not himself remain long in Spain,—although long enough to expend, out of his own resources, a very large sum of money ; but his companions continued to do good service in the Peninsula, in a military capacity, to the close of the war. In a subsequent communication to Southey, Landor speaks of a letter just received from his friend O'Hara. "This morning," he says, "I had a letter from Portugal, from a sensible man and excellent officer, Walter O'Hara. The officers do not appear," he continues, "to entertain very sanguine hopes of success. We have lost a vast number of brave men, and the French have gained a vast number, and fight as well as under the republic." The Walter O'Hara whom we here have Landor speaking of as "a sensible man and excellent officer," is the Col. O'Hara at whose homestead, on a portion of the Hallowell park-lot, we have arrived, and whose name is one of our household words. Colonel O'Hara built on this spot in 1831, at which date the surrounding region was in a state of nature. The area cleared for the reception of the still existing spacious residence, with its lawn, garden and orchards, remained for a number of years an oasis in the midst of a grand forest. A brief memorandum which we are enabled to give from his own pen of the Peninsular

portion of his military career, will be here in place, and will be deemed of interest. "I joined, he says, the Peninsular army in the year 1811, having obtained leave of absence from my British Regiment quartered at Canterbury, for the purpose of volunteering into the Portuguese army, then commanded by Lord Beresford. I remained in that force until the end of the war, and witnessed all the varieties of service during that interesting period during which time I was twice wounded, and once fell into the hands of a brave and generous enemy." From 1831 Col. O'Hara held the post of Adjutant General in Upper Canada. His contemporaries will always think of him as a chivalrous, high-spirited, warm-hearted gentleman; and in our annals hereafter he will be named among the friends of Canadian progress, at a period when enlightened ideas in regard to government and social life, derived from a wide intercourse with man in arge and ancient communities, were, amongst us, considerably misunderstood.

After passing the long range of suburban properties on which we have been annotating, the continuation, in a right line westward, of Lot Street, used to be known as the Lake Shore Road. This Lake Shore Road, after passing the dugway, or steep descent to the sands that form the margin of the Lake, first skirted the graceful curve of Humber Bay, and then followed the irregular line of the shore all the way to the head of the Lake. It was a mere track, representing doubtless a trail trodden by the aborigines from time immemorial. So late as 1813 all that could be said of the region traversed by the Lake Shore Road was the following, which we read in the "Topographical Description of Upper Canada," issued in London in that year, under the authority of Governor Gore: "Further to the westward (*i. e.* of the river Humber)," we are told, "the Etobicoke, the Credit, and two other rivers, with a great many smaller streams, join the main waters of the Lake; they all abound in fish, particularly salmon....the Credit is the most noted: here is a small house of entertainment for passengers. The tract between the Etobicoke and the head of the Lake," the Topographical Description then goes on to say, "is frequented only by wandering tribes of Mississaguas. At the head of Lake Ontario," we are then told, "there is a smaller Lake, within a long beach, of about five miles, from whence there is an outlet to Lake Ontario, over which there is a bridge. At the south end of the beach," it is added, "is the King's Head, a good inn, erected for the accommodation of travellers, by order of his Excellency Major-General Simcoe, the Lieutenant-Governor. It is beautifully situated at a small portage which leads from the head of a natural canal connecting Burlington Bay with Lake Ontario, and is a good landmark. Burlington Bay," it is then rather boldly asserted, "is perhaps as beautiful and romantic a situation as any in interior America, particularly if we include with it a marshy lake which falls into it, and a noble promontory that divides them. This lake is called Coote's Paradise, and abounds with game." (Coote's Paradise had its name from Capt. Coote, of the 8th, a keen sportsman.)

As to "the wandering tribes of Mississaguas" who in 1813 were still the only noticeable human beings west of the Etobicoke, they were in fact a portion of the great Otchibway nation. From time to time, previous and subsequent to 1813, and for pecuniary considerations of various amounts they surrendered to the local Government their nominal right over the regions which they still occupied in a scattered way. In 1792 they surrendered 3,000,000 acres, commencing four miles west of Mississagua point, at the mouth of the river Niagara for the sum of £1,180 7 4. On the 8th of August, 1797, they surrendered 3,450 acres in Burlington Bay for the sum of £65 2 6. On the 6th September, 1806, 85,000 acres, commencing on the east bank of the Etobicoke river, brought them £1,000 5. On the 28th of October, 1818, "the Mississagua tract, Home District," consisting of 648,000 acres, went for the respectable sum of £8,500. On the 8th of February, 1820, 2,000 acres, east of the Credit reserve, brought in £50. All circumstances at the respective dates considered, the values received for the tracts surrendered as thus duly enumerated may, by possibility, have been reasonable. Lord Carteret, it is stated, proposed to sell all New Jersey for £5,000, 150 years ago. But there remains one transfer from Mississagua to White ownership to be noticed, the equivalent accepted for which excites surprise; and we can offer no explanation. On the 1st of August, 1805, the records of the Indian Department inform us, the "Toronto Purchase" took place, comprising 250,880 acres and stretching eastward to the Scarboro' Heights: and the consideration accepted therefor was the sum of ten shillings. Two dollars for the site of Toronto and its suburbs with an area extending eastward to Scarborough heights. On the early map from which we have been taking the names of the first locatees of the range of park-lots extending along

Queen Street from Parliament Street to Humber Bay, we observe the easternmost limit of the "Toronto Purchase" conspicuously marked by a curved line drawn northwards from the water's edge near the commencement of the spit of land which used to fence off Ashbridge's Bay and Toronto Harbour from the lake.

In 1804, the Lake Shore Road stood in need of repairs, and in some places even of "opening" and "clearing out." In the *Oracle* of Aug. 4th, in that year, we have an advertisement for "Proposals from any person or persons disposed to contract for the opening and repairing the Road and building Bridges between the Town of York and the Head of Burlington Bay.' "Such proposals," the advertisement goes on to say, "must state what prices the Party desirous of undertaking the aforesaid work will engage to finish and complete the same, and must consist of the following particulars: At what price per mile such person will open and clear out such part of the road leading from Lot Street, adjoining the Town of York (beginning at Peter Street) to the mouth of the Humber, of the width of 33 feet, as shall not be found to stand in need of any causeway. With the price also per Rod at which such party will engage to open, clear out, and causeway such other part of the same road as shall require to be causewayed, and the last-mentioned price to include as well the opening and clearing out, as the causewaying such Road. The causewaying to be 18 feet wide; as also the price at which any person will engage to build Bridges upon the said Road of the width of 18 feet. And the same Commissioners will also receive proposals from any person or persons willing to engage to cut down three Hills at the following places, viz:—One at the Sixteen Mile Creek, another between the Sixteen and Twelve Mile Creek, and the third at the Twelve Mile Creek. And also for repairing, in a good and substantal manner, the Bridge at the outlet of Burlington Bay. All the before-mentioned work to be completed, in a good and substantial manner, on or before the last day of October next, and, when completed, the Money contracted to be given shall be paid by the Receiver-General. This advertisement is issued by William Allan and Duncan Cameron, of York; James Ruggles and William Graham, of Yonge Street; and William Applegarth, of Flamboro' East, Commissioners for executing Statute passed in Session of present year."

We now return to that point on Queen Street where, instead of continuing on westward by the Lake Shore Road, the traveller of a later era turned abruptly toward the north in order to pass into Dundas Street proper, the great highway projected, as we have observed, by the first organisers of Upper Canada and marked on the earliest manuscript maps of the Province, but not made practicable for human traffic until comparatively recent times.

From an advertisement in the *Oracle* of August 1806, we learn that Dundas Street was not, in that year, yet hewn out through the woods about the Credit. "Notice is hereby given," thus runs the advertisement referred to, "that the Commissioners of the Highways of the Home District will be ready on Saturday, the 23rd day of the present month of August, at eleven o'clock in the forenoon, at the Government Buildings in the town of York, to receive proposals and to treat with any person or persons who will contend to open and make the road called Dundas Street, leading through the Indian Reserve on the River Credit; and also to erect a bridge over the said River at or near where the said Road passes. Also to bridge and causeway (in aid to the Statute Labour) such other parts of such Road passing through the Home District, when such works are necessary, and for the performance of which the said Statute Labour is not sufficient. Thomas Ridout, Clerk of the Peace, Home District. York, 6th August, 1806."

The early line of communication with the Head of the Lake was by the Lake Shore Road. This cross thoroughfare between the park lots of Mr. Bouchette or Col. Givins and Mr. David Burns, was opened up by Col. G. T. Denison, senior, with the assistance of some of the embodied militia. The work of opening the road here, as well as further on through the front, was at first undertaken by a detachment of the regulars under the direction of an officer of the Royal Engineers. The plan adopted, we are told, was first to fell each tree by very laboriously severing it from its base close to the ground, and then to smooth off the upper surface of the root or stump with an adze. As this process was necessarily slow, and after all not likely to result in a permanently good road, the proposal of Colonel, then Lieutenant, Denison to set his militia-men to eradicate the trees bodily, was accepted—an operation with which they were all more or less familiar on their farms and in their new clearings. A fine broad

open track, ready, when the day for such further improvements should arrive, for the reception of plank or macadam, was soon constructed.

Immediately at the turn northwards, out of the line of Lot Street, on the east side, were Sandford's Inn, a watering-place for teams on their way into York, provided accordingly with a conspicuous pump and great trough, a long section of a huge pine tree dug out like a canoe. Near by, a little to the east, was another notable inn, an early rival, as we suppose, of Sandford's: this was the Blue Bell. A sign to that effect, at the top of a strong and lofty pole in front of its door, swung to and fro within a frame.

Just opposite, on the Garrison Common, there were for a long while low log buildings belonging to the Indian department. One of them contained a forge, in charge of Mr. Higgins, armourer to the department. Here the Indians could get, when necessary, their fishing-spears, axes, knives and tomahawks, and other implements of iron, sharpened and put in order. One of these buildings was afterwards used as a school for the surrounding neighbourhood.

Immediately across from Sandford's, on the park lot originally occupied by Mr. Burns, was a house, shaded with great willow-trees, and surrounded by a flower-garden and lawn, the abode for many years of the venerable widow of Capt. John Denison, who long survived her husband. Of her we have already once spoken in connexion with Peterfield. She was, as we have intimated, a sterling old English gentlewoman of a type now vanishing, as we imagine. The house was afterwards long in the occupation of her son-in-law, Mr. John Fennings Taylor, a gentleman well-known to Canadian M.P.'s during a long series of years, having been attached as Chief Clerk and Master in Chancery first to the Legislative Council of United Canada and then to the Senate of the Dominion.

To the right and left, as we passed north, was a wet swamp, densely filled with cedars of all shapes and sizes, and strewn plentifully with granitic boulders: a strip of land held in light esteem by the passers-by, in the early day, as seeming to be irreclaimable for agricultural purposes. But how admirably reclaimable in reality the acres hereabout were for the choices human purposes, was afterwards seen, when, for example, the house and grounds known as Foxley Grove, came to be established. By the outlay of some money and the exercise of some discrimination, a portion of this same cedar swamp was rapidly converted into pleasure-ground, with labyrinths of full-grown shrubbery ready-prepared by nature's hand. Mr. James Bealey Harrison, who thus transformed the wild into a garden and plaisaunce, will be long remembered for his skill and taste in the culture of flowers and esculents choice and rare: as well as for his eminence as a lawyer and jurist. He was a graduate of Cambridge; and before his emigration to Canada, had attained distinction at the English bar. He was the author of a work well known to the legal profession in Great Britain and here, entitled "An Analytical Digest of all the Reported Cases determined in the House of Lords, the several Courts of the Common Law in Banc and at Nisi Prius, and the Court of Bankruptcy, from Michaelmas Term, 1756, to Easter Term, 1843; including also the Crown Cases Referred: in Four Volumes." During the regime of Sir George Arthur, Mr. Harrison was Secretary of the Province and a member of the Executive Council; and at a later period he was Judge of the County and Surrogate Courts. The memory of Judge Harrison, as an English Gentleman, genial, frank, and straightforward, is cherished among his surviving contemporaries.

On turning westward into Dundas Street proper, we were soon in the midst of a magnificent pine forest, which remained long undisturbed. The whole width of the allowance for road was here for a number of miles completely cleared. The highway thus well-defined was seen bordered on the right and left with a series of towering columns, the outermost ranges of an innumerable multitude of similar tall shafts set at various distances from each other, and circumscribing the view in an irregular manner on both sides, all helping to bear up aloft a matted awning of deep-green, through which, here and there, glimpses of azure could be caught, looking bright and cheery. The yellow pine predominated, a tree remarkable for the straightness and tallness of its stems, and for the height at which its branches begin. No fence on either hand intervened between the road and the forest; the rider, at his pleasure, could rein his horse aside at any point and take a canter in amongst the columns, the underwood being very slight. Everywhere, at the proper season, the ground was sprinkled with wild flowers, with the wild lupin and the wild columbine; and everywhere, at all times, the air was more or less fragrant with resinous exhalations.

In the heart of the forest, midway between York and the bridge over the Humber, was another famous resting-place for teams—the Peacock Tavern—a perfect specimen of a respectable wayside hostelry of the olden time, with very spacious driving-houses and other appropriate outbuildings on an extensive scale.

Not far from the Peacock a beaten track branched off westerly, which soon led the Equestrian into the midst of beautiful oak woods, the trees constituting it of no great magnitude, but, as is often the case on sandy plains, of a gnarled, contorted aspect, each presenting a good study for the sketcher. This track also conducted to the Humber, descending to the valley of that stream where its waters, now become shallow but rapid, passed over sheets of rock. Here the surroundings of the bridle-road and foot-path were likewise picturesque, exhibiting rock plentifully amidst and beneath the foliage and herbage. Here in the vale of the Humber stood a large Swiss-like structure of hewn logs, with two tiers of balcony on each of its sides. This was the house of Mr. John Scarlett. It was subsequently destroyed by fire. Near by were mills and factories also belonging to Mr. Scarlett. He was well connected in England; a man of enlightened views and fine personal presence. He loved horses and was much at home in the saddle. A shrewd observer when out among his fellow men, at his own fireside he was a diligent student of books.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JANUARY, 1871.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6. A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10P.M.	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	MEN.		
					°	°	°	°	°																			
1	—	29.700	—	—	—	32.7	—	—	—	—	.165	—	—	—	88	—	—	N	W S W	S S W	S 34 W	4.1	13.2	16.3	10.16	11.43	...	inap.
2	29.192	.394	29.636	29.4252	36.0	27.0	19.4	26.85	— 5.57	.162	.100	.075	.106	76	68	81	72	S W b S	W b S	W S W	S 71 W	12.5	35.0	16.4	20.84	21.25	...	0.2
3	.520	.521	.808	.6247	19.0	21.7	4.2	14.63	— 6.62	.085	.080	.044	.071	83	68	78	79	S W b W	W	W N W	S 85 W	15.0	26.8	4.0	12.28	13.94	...	0.5
4	.823	.834	.659	.7462	3.5	15.4	19.7	12.68	— 8.55	.044	.077	.091	.069	87	87	91	86	W	S W b W	S E b E	S 31 W	6.0	12.8	15.5	5.67	9.56	...	2.5
5	.251	.062	.147	.1527	34.5	38.8	35.6	36.45	+15.23	.144	.144	.159	.149	72	61	80	69	S b W	S W b S	S W b W	S 49 W	13.0	16.0	13.0	14.75	15.73	inap.	...
6	.337	.468	.726	.5392	29.1	28.0	12.9	21.95	+ 0.73	.141	.088	.055	.093	87	57	80	75	S W b W	W b N	N W b N	N 77 W	12.2	18.0	8.5	10.46	12.40	...	0.1
7	.884	.869	.779	.8495	1.3	15.8	20.1	12.75	— 8.47	.043	.072	.096	.071	91	80	85	86	N b W	E b N	S E b S	S 64 E	6.2	4.0	8.5	2.76	6.08	...	0.3
8	—	.594	—	—	—	16·5	—	—	—	—	.069	—	—	—	77	—	—	S E b E	N E b N	N	N 36 E	11.7	25.4	9.9	10.11	12.61	...	6.5
9	30·042	30.023	30.003	30.0217	8.5	19.0	18.3	14.87	— 6.37	.054	.072	.068	.066	84	71	74	77	N b W	W S W	W S W	N 74 W	6.0	2.2	2.0	2.13	4.00	...	...
10	29.896	29.712	29.661	29.7480	22.6	24.1	28.4	24.92	+ 3.65	.091	.120	.135	.116	74	93	90	85	S b W	S E b S	S E b S	S 28 E	13.5	14.2	10.2	9.34	9.96	...	4.5
11	.530	.511	.652	.5688	33.4	37.2	35.6	35.98	+14.67	.171	.199	.202	.192	89	89	93	90	E S E	S S W	S S W	N 20 E	6.0	4.0	1.0	1.92	2.56	...	...
12	.756	.836	.926	.8543	36.3	42.8	36.7	38.18	+16.82	.203	.232	.202	.211	94	84	94	91	E b S	E N E	E b N	N 65 E	2.5	2.0	3.6	3.53	3.70	...	...
13	.929	.928	.958	.9498	36.0	45.4	36.7	39.70	+18.28	.196	.225	.237	.210	93	74	94	86	N E	S S E	S E	N 12 E	5.2	3.4	2.0	3.26	5.84	...	...
14	30.032	30.020	.973	30.0028	36.3	34.3	26.8	32.17	+10.72	.177	.176	.133	.156	82	88	85	85	N b W	N E b N	N E b E	N 31 E	17.0	9.4	11.6	11.58	12.61	.050	...
15	—	29.478	—	—	—	32.0	—	—	—	—	.166	—	—	—	91	—	—	N E b E	E N E	N W b W	N 17 W	13.2	7.4	10.9	8.45	10.63	.400	0.2
16	29.628	29.729	.825	29.7400	19.7	14.3	17.9	17.30	— 4.28	.096	.065	.085	.083	91	78	87	87	N W b N	N W b N	W N W	N 46 W	18.6	17.8	7.0	11.41	11.71	...	2.5
17	.848	.807	.893	.8587	7.5	23.0	25.5	19.28	— 2.33	.054	.106	.122	.096	88	86	88	88	W N W	W b S	W S W	S 78 W	6.2	11.8	8.0	4.73	6.65	...	0.1
18	30.024	30.122	30.204	30.1253	20.8	20.8	17.2	19.55	— 2.13	.097	.083	.084	.089	87	75	91	84	N	N E b N	N E	N 34 E	9.0	9.0	9.6	7.44	8.26	...	inap.
19	30.186	30.090	29.970	30.0767	17.6	28.0	29.8	24.97	+ 3.22	.083	.117	.136	.116	85	76	84	84	N N E	E N E	S S E	S 56 E	6.5	3.0	4.8	2.36	4.58	...	0.1
20	29.869	29.743	.707	29.7672	28.0	34.2	33.4	32.47	+10.65	.139	.160	.174	.163	90	81	89	88	S W	S W	S W b S	S 57 W	5.0	3.8	4.6	5.59	6.13	inap.	...
21	.631	.324	.484	.4788	31.3	32.0	23.2	27.35	+ 5.47	.144	.166	.067	.130	81	91	76	83	W b S	S b W	N W b W	N 48 W	7.0	2.8	25.0	10.14	12.53	...	4.0
22	—	.836	—	—	—	—1.2	—	—	—	—	.028	—	—	—	68	—	—	N	N W b W	N	N 11 W	9.3	13.0	9.9	7.62	8.20	...	...
23	.888	.740	.740	.7870	—11.2	—6.4	—1.6	—5.70	+27.72	.024	.029	.039	.032	86	89	94	90	N N E	N N E	N E b N	N 23 E	16.0	19.0	12.8	14.66	14.75	...	4.5
24	.742	.802	.950	.8482	—0.5	12.5	16.8	10.35	—11.72	.036	.062	.081	.062	85	80	85	84	N	S W b W	W b S	N 60 W	4.0	3.2	8.6	3.32	5.48	...	inap.
25	30.206	30.388	30.327	30.3165	4.6	—0.8	—2.6	—1.05	—23.17	.048	.034	.031	.035	90	81	84	84	N	N b W	N E b N	N 20 E	19.0	9.5	18.6	14.18	15.05	...	5.0
26	30.105	29.821	29.751	29.8583	—6.4	5.3	3.9	2.40	—19.78	.030	.052	.049	.046	89	93	92	91	N E b N	N E	N b W	N 27 E	17.6	15.8	5.5	8.66	11.55	...	6.0
27	29.586	.644	.845	.7110	17.9	25.2	17.2	18.72	— 3.52	.085	.087	.058	.077	87	63	78	75	S W b W	W b N	W	N 87 W	17.0	21.5	4.0	9.21	11.38	...	0.1
28	.890	.794	.673	.7717	8.5	14.0	10.0	11.02	—11.30	.054	.062	.058	.057	84	76	78	79	N b E	N E b E	N E b N	N 46 E	7.2	18.5	17.5	12.63	13.05	...	6.0
29	—	.427	—	—	—	30.6	—	—	—	—	.152	—	—	—	89	—	—	N E b N	S W b S	S W b S	S 46 W	1.5	13.0	10.9	5.75	8.42	...	0.3
30	.810	.685	.584	.6858	27.3	32.7	31.3	30.67	+ 8.23	.126	.172	.182	.158	84	92	97	91	N E	E S E	E N E	S 89 E	5.0	6.6	3.4	3.62	4.18	.100	0.2
31	.368	.094	.205	.2250	33.8	37.4	37.8	36.40	+13.92	.190	.213	.172	.196	98	95	77	91	E	S b E	S W W	S 62 W	1.5	8.4	22.2	8.88	10.91	.314	...
	29.7682	29.7293	29.7725	29.7590	19.05	23.91	21.32	21.34	— 0.34	.104	.115	.109	.110	86	80	86	84	.....	.....	.....	.....	9.50	11.95	9.86	.....	9.84	.864	43.6

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JANUARY, 1871

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.388 at 2 p.m. on 25th.
Lowest Barometer.....29.048 at 4 p.m. on 31st. } Monthly range= 1.340

Self-registering Ther.
- Maximum temperature.....46°4 on 13th.
- Minimum temperature.....—13.2 on 23rd. } Monthly range= 59°6
- Mean maximum temperature.....28°41
- Mean minimum temperature.....13°41 } Mean daily range= 15°00
- Greatest daily range..... 34°6 from a.m. of 4th to a.m. of 5th.
- Least daily range.....2°9 from a.m. to p.m. of 14th.

Warmest day..... 13th; mean temperature 39°70
Coldest day.....23rd; mean temperature—5°70 } Difference=45°40

Maximum Solar..... 60°5 on 13th.
Radiation Terrestrial..... —19°5 on 23rd. } Monthly range= 80°0

Aurora observed on 3 nights, viz.: 13th, 21st and 27th.

Possible to see aurora on 9 nights; impossible on 22 nights.

Snowing on 23 days; depth 43.6 inches; duration of fall 140.2 hours.

Raining on 8 days; depth, 0.864 inches; duration of fall, 28.5 hours.

Mean of cloudiness=0.80.

WIND.

Resultant direction, N. 49° W.; Resultant velocity, 2.56.

Mean velocity, 9.84 miles per hour.

Maximum velocity, 35.5 miles, from 1 to 2 p.m. of 2nd.

Most windy day, 2nd; mean velocity, 21.25 miles per hour.

Least windy day, 11th; mean velocity, 2.56 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 12.08 miles per hour.

Least windy hour, 1 a.m.; mean velocity, 8.38 miles per hour.

Fog recorded 11th, 12th, 13th, 30th & 31st. Solar halo 17th. Lunar haloes 9th & 31st.

8th, very stormy; snow and drift.

23rd, very stormy; furious snow and drift. 28th, stormy; snow and drift.

17th, bay completely frozen—the E. & S.E. portion having been kept open by the current through the gut.

11th to 14th, well marked January thaw.

COMPARATIVE TABLE FOR JANUARY.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	RAIN. Inches.	SNOW. No. of days.	SNOW. Inches.	WIND. Resultant. Direction.	Resultant. V'locity.	Mean Velocity.
	°	°	°	°	°							lbs
1843	28.7	+ 5.6	55.4	— 1.8	57.2	6	4.295	12	14.2	...	...	0.69
1844	20.2	— 2.9	45.3	— 7.2	52.5	7	3.005	11	24.9	...	...	0.70
1845	26.5	+ 3.4	45.7	— 0.2	45.9	5	impr.	9	22.7	...	...	0.70
1846	26.7	+ 3.6	44.0	— 1.3	45.3	5	2.335	10	6.0	...	...	0.55
1847	23.3	+ 0.2	42.4	+ 2.7	39.7	7	2.135	5	7.5	...	...	1.09
1848	28.7	+ 5.6	51.1	—11.4	62.5	7	2.245	8	7.1	N 82 w	2.03	5.82 m.
1849	18.5	— 4.6	39.5	—14.2	53.7	4	1.175	10	9.2	N 63 w	3.06	6.71
1850	29.7	+ 6.6	46.4	9.9	36.5	5	1.250	8	5.2	N 37 w	0.69	5.80
1851	25.5	+ 2.4	43.4	—12.8	56.2	4	1.275	10	7.8	S 77 w	3.26	7.69
1852	18.4	— 4.7	37.3	—10.6	47.9	0	0.000	19	30.9	N 68 w	3.14	7.67
1853	23.0	— 0.1	40.9	— 9.7	50.6	1	0.290	6	7.5	N 27 w	2.52	6.34
1854	23.6	+ 0.5	46.4	— 5.4	51.8	7	1.270	11	7.5	N 71 w	2.44	6.91
1855	25.9	+ 2.8	49.0	— 5.4	54.4	5	0.525	13	23.3	N 73 w	1.91	7.26
1856	16.0	— 7.1	34.4	—12.0	46.4	0	0.000	14	13.6	N 75 w	5.24	10.69
1857	12.8	—10.3	37.2	—20.1	57.3	3	inap.	16	21.8	N 70 w	4.96	10.31
1858	30.0	+ 6.9	47.4	6.5	40.9	6	1.152	11	4.0	N 71 w	2.33	7.40
1859	26.4	+ 3.3	43.2	—26.5	69.7	6	1.449	19	16.4	S 81 w	3.17	8.76
1860	23.4	+ 0.3	46.4	— 6.8	53.2	6	0.740	16	8.7	N 89 w	6.09	9.37
1861	19.9	— 3.2	37.0	—11.2	48.2	4	0.685	23	20.6	N 86 w	2.92	9.30
1862	21.7	— 1.4	44.5	— 2.6	47.1	5	0.115	19	27.4	N 26 w	2.69	8.83
1863	28.1	+ 5.0	47.0	—14.0	61.0	10	1.122	17	20.6	N 61 w	1.13	7.23
1864	22.8	— 0.3	44.2	— 9.0	53.2	5	1.165	14	26.3	S 73 w	6.00	10.22
1865	17.7	— 5.4	37.2	— 9.0	46.2	1	0.440	18	14.8	N 85 w	4.80	9.39
1866	20.7	— 2.4	44.0	—14.0	58.0	4	0.522	19	10.3	N 75 w	2.98	9.34
1867	17.6	— 5.5	43.8	— 4.8	48.6	1	inap.	21	42.0	N 55 w	3.27	6.96
1868	19.0	— 4.1	39.0	— 7.0	46.0	2	inap.	21	14.6	S 83 w	3.97	8.90
1869	27.7	+ 4.6	45.0	— 1.0	46.0	4	0.887	12	9.8	N 72 w	3.40	9.21
1870	24.4	+ 1.3	45.0	— 3.2	48.2	8	3.412	18	21.3	S 89 w	2.63	8.98
1871	21.3	— 1.8	46.4	—13.2	59.6	8	0.864	23	43.6	S 49 w	2.56	9.84
Results to 1869.	23.14	.....	43.65	—7.22	50.87	4.48	1.240	13.68	15.93	N 78 w	3.06	8.22
Excess of 1870.	— 1.80	.....	+ 2.75	— 5.98	+ 8.73	+ 3.52	— 0.376	+ 9.32	+ 27.67	...	...	+ 1.62

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Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M	2 P.M	10 PM	ME'N		6 A.M.	2 P.M.	10 P.M	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	M'N.		
					°	°	°	°	°																			
1	29.568	29.636	29.639	29.6250	31.8	32.7	30.9	31.53	+ 8.98	.138	.150	.149	.144	76	80	86	80	W b S	S	S W b S	S 44 W	12.2	5.2	4.6	6.07	7.48	...	...
2	.478	.299	.699	.5100	29.8	35.3	17.2	26.65	+ 4.03	.147	.146	.062	.115	88	71	65	75	S	W S W	W b S	S 74 W	6.8	25.0	19.0	16.28	18.37	...	0.3
3	.384	.190	.333	.3037	20.5	34.5	33.1	30.02	+ 7.35	.081	.148	.130	.117	73	75	69	69	S W b W	W S W	W b N	N 85 W	17.6	25.4	41.3	21.31	23.70	...	...
4	.513	.701	.837	.7177	16.8	3.9	−3.4	3.53	−19.18	.080	.035	.025	.041	85	65	69	72	N W b N	N N W	N N W	N 14 W	16.4	17.0	12.0	13.50	13.69	...	...
5	—	30.009	—	—	—	−4.1	—	—	—	—	.028	—	—	—	80	—	—	—	N	N	N 1 W	9.7	8.4	12.2	9.46	9.49	...	...
6	.993	29.975	30.033	.9975	−4.8	11.8	10.4	5.80	−17.03	.032	.052	.049	.046	90	70	70	78	N	N	N	N 4 W	13.0	8.2	4.8	6.60	6.74	...	...
7	.988	.868	29.654	.8247	12.2	20.8	26.2	20.45	− 2.45	.059	.097	.124	.096	78	86	87	84	N b E	E N E	E N E	N 68 E	9.8	13.8	19.8	9.10	9.67	...	0.3
8	.602	.600	.531	.5717	25.2	32.7	31.3	30.03	+ 7.07	.122	.157	.160	.149	90	84	90	88	Calm.	Calm.	S S E	S 49 E	0.0	0.0	5.6	1.55	2.19	...	1.0
9	.308	.355	.615	.4370	32.7	33.4	25.9	30.37	+ 7.33	.174	.163	.113	.145	92	85	81	84	E b N	W S W	W	S 73 W	6.0	28.1	17.6	13.85	15.37	...	1.5
10	.705	.883	.993	.8845	19.0	20.8	17.6	18.40	− 4.67	.091	.070	.083	.075	89	63	85	75	W b S	W	S W W	S 80 W	15.2	22.5	10.0	15.98	16.14	...	3.1
11	30.081	30.041	.993	30.0367	16.9	20.5	18.3	17.77	− 5.40	.071	.061	.068	.068	77	55	68	70	W S W	W S W	W b N	N 58 W	9.6	3.6	1.8	2.94	6.72	...	0.1
12	—	29.494	—	—	—	18.6	—	—	—	—	.083	—	—	—	82	—	—	N E b N	N E	N W b N	N 21 E	15.3	17.8	7.1	10.70	11.77	...	6.0
13	29.762	.831	.815	29.8005	6.4	18.6	18.6	14.18	− 9.12	.050	.076	.084	.069	85	77	83	82	N N W	S W b W	S S W	S 59 W	6.0	3.6	3.0	0.15	3.38	...	...
14	.658	.639	.764	.6947	20.8	24.8	15.4	20.27	− 3.13	.097	.098	.077	.090	86	73	87	82	N b E	W b N	W b N	N 58 W	4.5	6.8	6.0	3.92	5.84	...	...
15	.749	.582	.335	.5375	11.8	32.7	34.2	27.85	+ 4.35	.063	.150	.146	.128	86	80	75	81	W b S	E S E	S b W	S 23 E	3.4	10.7	5.8	5.37	9.35	...	...
16	.305	.528	.706	.5285	36.7	36.7	25.5	32.90	+ 9.32	.164	.118	.111	.129	75	53	81	69	W b S	W N W	W	N 81 W	16.0	19.6	1.4	10.25	10.63	...	0.1
17	.698	.539	.112	.4135	21.5	34.3	32.7	29.92	+ 6.22	.091	.146	.172	.142	79	74	92	84	S W b W	E b N	E	East.	0.5	7.5	10.0	5.22	6.48	.040	12.0
18	28.673	.093	.463	.1060	34.5	24·4	16.5	24.88	+ 1.08	.192	.089	.076	.116	96	68	83	79	N b E	W N W	Calm	N 63 W	4.2	37.0	0.0	12.74	13.33	...	...
19	—	.400	—	—	—	31.6	—	—	—	—	.148	—	—	—	83	—	—	W	W b N	W S W	S 70 W	5.4	17.0	7.3	8.24	9.15	...	Inap.
20	29.617	.696	.795	.7157	25.2	27.3	14.0	21.78	− 2.27	.122	.097	.056	.092	90	66	68	76	S W b W	N W	N	N 17 W	2.8	8.0	11.5	6.88	7.31	...	Inap.
21	.876	.951	30.046	.9492	8.5	21.9	11.8	14.27	− 9.95	.054	.077	.068	.065	84	66	86	77	N b E	E b N	N N E	N 22 E	7.5	0.5	6.6	3.33	3.62	...	...
22	30.09	.08	29.996	30.0547	12.2	23.0	25.2	19.15	− 5.17	.067	.086	.107	.080	90	69	79	78	N N E	E b N	E b N	N 68 E	3.2	12.2	7.0	6.15	6.66	...	Inap.
23	29.919	29.806	.677	29.7900	18.3	32.7	36.3	29.35	+ 4.87	.080	.128	.176	.132	81	68	82	79	N E b N	E	E b N	N 79 E	2.5	6.8	4.2	3.64	3.99	...	...
24	.490	.182	.194	.2745	37.8	44.6	43.5	42.40	+17.78	.190	.245	.214	.217	84	83	75	80	E	S	W S W	S 56 W	4.8	6.5	37.5	11.44	12.84	Inap.	...
25	.449	.484	.486	.4725	36.3	38.8	30.9	35.67	+10.87	.143	.135	.127	.137	66	57	73	65	W S W	W b S	Calm.	S 82 W	10.2	11.8	0.0	6.31	7.00	...	...
26	—	.187	—	—	—	31.5	—	—	—	—	.149	—	—	—	84	—	—	N	N E	N b W	N 2 E	0.5	14.6	10.3	5.92	9.33	Inap.	0.3
27	.110	.280	.593	.3593	29.1	28.4	23.3	26.28	− 1.18	.141	.098	.089	.107	87	62	71	74	W	N W b W	N W b W	N 66 W	11.5	21.5	17.5	15.16	15.78	...	0.3
28	.765	.673	.290	.5422	23.6	30.2	35.6	30.38	+ 4.98	.098	.112	.142	.122	79	67	68	72	W b S	S	S	S 19 W	7.0	13.2	6.0	8.27	10.94	...	...
	29.6159	29.6216	29.6500	29.6311	21.76	27.76	23.79	24.33	+ 0.69	.106	.114	.109	.109	84	71	78	77					7.91	13.30	10.35		9.87	0.040	23.0

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR FEBRUARY, 1871.

NOTE—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....30.119 at 8 a.m. on 22nd } Monthly range=
Lowest Barometer .....28.673 at 6 a.m. on 18th } 1.446 inches.

Self-registering Ther.
- Maximum Temperature .....48°0 on 24th } Monthly range=
- Minimum Temperature .....—15°8 on 5th. } 63°8
- Mean Maximum Temperature .....30°36 } Mean daily range=
- Mean Minimum Temperature .....17°03 } 13°33
- Greatest daily range.....38°1 from midnight of 3rd to midnight of 4th.
- Least daily range ..... 3°2 from a.m. to p.m. of 27th.

Warmest Day..... 24th ... Mean Temperature.....42°40 } Difference=49°60
Coldest Day..... 5th ... Mean Temperature.....—7°20 }

Maximum Radiation.
- Solar .....57°4 on 25th } Monthly range=
- Terrestrial.....—19°2 on 5th } 76°6

Aurora observed on 4 nights, viz., 11th, 16th, 21st, and 24th.
Possible to see Aurora on 12 nights; impossible on 16 nights.
Snowing on 15 days; depth 23.0 inches; duration of fall 69.1 hours.
Raining on 3 days; depth 0.040 inches; duration of fall 5.7 hours.
Mean of Cloudiness=0.71.

WIND.

Resultant Direction N. 70° W.; Resultant Velocity 4.26.
Mean Velocity 9.87 miles per hour.
Maximum Velocity 41.5 miles, from 10 to 11 p.m. of 3rd.
Most Windy day 3rd; Mean Velocity 23.70 miles per hour.
Least Windy day 8th; Mean Velocity 2.19 miles per hour.
Most Windy hour 2 p.m.; Mean Velocity 13.25 miles per hour.
Least Windy hour 3 a.m.; Mean Velocity 7.45 miles per hour.

Solar haloes on 15th, 20th, 22nd and 28th.
Lunar haloes 4th, 6th, 25th and 28th.
Crows active 28th.

COMPARATIVE TABLE FOR FEBRUARY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°							
1843	14.5	— 8.5	38.5	— 9.4	47.9	1	0.475	21	14.4	...	...	1.05 lbs
1844	26.0	+ 3.0	47.9	0.6	47.3	4	0.430	7	10.0	...	...	0.43
1845	26.0	+ 3.0	49.1	— 4.2	53.3	5	Imp.	9	19.0	...	...	0.99
1846	20.4	— 2.6	41.9	—16.7	58.6	0	0.000	13	46.1	...	...	0.65
1847	21.5	— 1.5	40.9	0.0	40.9	2	0.550	13	27.3	...	...	0.69
1848	26.6	+ 3.6	46.6	0.0	46.6	4	0.775	8	10.8	N 65 W	2.53	5.69mls
1849	19.5	— 3.5	40.6	— 9.8	50.4	2	0.240	13	19.2	N 41 W	1.48	6.58
1850	26.0	+ 3.0	49.6	2.2	47.4	7	1.235	9	23.1	N 80 W	3.48	7.61
1851	27.6	+ 4.6	50.2	2.0	48.2	7	2.600	4	2.4	N 64 W	1.99	6.94
1852	23.4	+ 0.4	41.2	— 6.2	47.4	3	0.650	11	13.0	S 75 W	3.34	6.42
1853	24.1	+ 1.1	43.4	— 1.4	44.8	4	1.030	15	12.6	N 49 W	2.51	7.30
1854	21.1	— 1.9	42.8	—10.8	53.6	5	1.460	15	18.0	N 7 E	1.73	6.91
1855	15.4	— 7.6	39.0	—25.4	64.4	2	1.770	14	21.8	N 40 W	4.34	8.17
1856	15.7	— 7.3	37.8	—18.7	56.5	0	0.000	8	9.7	N 81 W	7.70	10.71
1857	28.5	+ 5.5	52.4	— 5.9	58.3	11	3.050	11	11.7	S 78 W	3.68	9.82
1858	17.0	— 6.0	42.4	— 7.3	49.7	1	Inap.	16	26.7	N 72 W	3.22	9.12
1859	26.0	+ 3.0	46.2	2.1	44.1	6	0.455	14	8.3	N 54 W	2.72	8.50
1860	22.8	— 0.2	50.2	— 8.5	58.7	7	1.330	13	18.8	N 61 W	3.28	8.73
1861	26.1	+ 3.1	46.0	—20.8	66.8	4	0.815	17	29.7	N 77 W	3.86	10.58
1862	22.5	— 0.5	37.8	— 5.2	43.0	3	0.180	17	23.1	N 55 W	3.93	8.52
1863	22.4	— 0.6	41.5	—19.8	61.3	7	1.450	12	22.0	N 23 W	2.27	10.13
1864	24.3	+ 1.3	45.0	—15.0	60.0	2	0.397	14	9.5	S 84 W	6.48	10.11
1865	22.4	— 0.6	42.2	—10.0	52.2	5	0.810	11	16.8	N 23 W	3.95	8.23
1866	22.5	— 0.5	45.0	— 8.0	53.0	3	0.830	12	16.9	S 80 W	5.14	9.40
1867	28.9	— 5.9	44.0	0.2	43.8	8	1.328	13	13.4	N 57 W	1.58	8 85
1868	17.2	— 5.8	45.0	—11.5	56.5	1	0.040	16	32.8	N 69 W	3.23	10.84
1869	25.0	+ 2.0	46.0	— 1.0	47.0	2	0.165	19	39.7	N 34 W	4.18	10.04
1870	21.5	— 1.5	40.6	— 6.6	47.2	2	0.520	18	20.1	N 29 W	2.84	8.10
1871	24.3	+ 1.3	48.0	—15.8	63.8	3	0.040	15	23.0	N 70 W	4.26	9.87
Result's to 1870.	22.97	...	44.06	—7.68	51.74	4.03	0.923	12.48	19.17	N 66 W	3.09	8.58
Excess for '71.	+ 1.36	...	+ 3.94	— 8.12	+ 12.06	— 1.03	— 0.883	+ 2.52	+ 3.83	...	...	+ 1.29

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MARCH, 1871.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 PM	ME'N.	Excess of Mean above Normal.	Tension of Vapour. 6 A.M.	2 P.M.	10 P.M.	M'N.	Humidity of Air. 6 A.M.	2 P.M.	10 P.M.	M'N.	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN	Rain in inches.	Snow in inches.
					°	°	°	°	°																			
1	29.175	29.478	29.734	29.4937	38.5	35.3	29.1	34.07	+ 8.50	·121	·113	·111	·114	52	54	69	58	W S W	W b S	N W	S 89 W	26.5	21.8	2.2	10.36	12.07	...	1.5
2	.711	.436	.307	.4730	29.1	34.9	34.9	33.20	+ 7.40	.126	.186	.186	.169	78	92	92	88	E	E N E	N E b E	N 57 E	7.2	3.6	3.5	4.80	5.45	.600	inap.
3	.074	.391	.668	.4037	37.8	29.8	25.2	29.93	+ 3.92	.208	.140	.115	.144	91	84	85	85	N N W	N W b W	Calm.	N 43 W	11.5	18.0	0.0	11.40	11.55	.150	0.2
4	.708	.644	.644	.6690	20.5	32.4	32.0	28.77	+ 2.52	.093	.131	.166	.130	85	71	91	81	N	S b W	W S W	S 41 W	5.0	2.4	4.2	2.09	2.77	...	...
5	—	.625	—	—	—	38.8	—	—	—	—	.186	—	—	—	79	—	—	W S W	S	N E b N	N 35 E	0.3	3.8	3.8	1.41	3.37	...	...
6	.390	.686	.868	.6645	34.9	36.3	30.6	33.62	+ 6.85	.186	.140	.138	.155	92	65	80	80	W N W	N W b W	W N W	N 57 W	14.4	22.6	0.8	13.71	13.82	...	...
7	.836	.659	.539	.6640	23.7	36.7	36.0	33.15	+ 6.15	.112	.137	.164	.144	87	63	77	76	Calm	E	N E b E	N 87 E	0.0	12.0	5.0	5.19	6.00	...	...
8	.535	.476	.410	.4635	37.8	43.9	43.9	42.17	+14.87	.173	.189	.235	.200	76	66	82	74	E b N	E N E	N E b E	N 56 E	1.6	8.8	2.8	6.00	6.16	...	...
9	.359	.238	.380	.3235	39.9	53.3	43.2	45.05	+17.50	.206	.261	.244	.233	84	63	87	78	N E b E	N E b E	S b W	S 26 E	6.6	10.2	11.5	3.36	8.99	.060	...
10	.518	.548	.651	.5762	37.4	45.4	46.4	42.35	+14.48	.170	.179	.114	.158	76	59	35	60	S W	S b W	S W b W	S 31 W	7.4	17.0	9.0	7.66	8.14	...	...
11	.612	.576	.559	.5777	37.8	39.6	36.3	38.15	+10.02	.165	.219	.202	.195	82	90	94	84	N E	N W b N	Calm.	N 2 E	0.8	10.6	0.0	5.28	6.84	1.050	1.0
12	—	.260	—	—	—	37.1	—	—	—	—	.166	—	—	—	75	—	—	N	N W b W	W b N	N 51 W	15.4	28.2	2.9	10.68	11.21	...	0.6
13	.536	.562	.658	.5917	29.8	37.0	31.3	32.37	+ 3.60	.154	.176	.144	.154	93	79	81	83	Calm.	S S W	N N W	S 52 W	0.0	7.4	4.2	1.93	4.15	...	0.2
14	.792	.778	.756	.7752	27.3	36.3	31.3	32.00	+ 2.92	.118	.123	.152	.130	79	56	86	72	N W b N	S E b E	N E b E	N 69 E	2.8	8.0	9.8	5.24	6.23	...	1.5
15	.708	.592	.670	.6510	32.7	32.7	33.1	32.77	+ 3.35	.157	.169	.174	.166	85	90	92	89	E b N	E N E	E N E	N 68 E	13.4	16.2	10.8	12.56	12.62	.570	...
16	.603	.434	.357	.4368	32.4	38.1	39.6	37.23	+ 7.48	.169	.187	.232	.205	91	81	95	91	E b N	E N E	W b S	N 62 E	10.2	7.6	0.8	4.73	5.67	.294	...
17	.295	.439	.612	.4690	39.9	41.0	34.9	38.53	+ 8.45	.241	.192	.151	.194	98	75	75	82	W S W	W	W S W	S 84 W	2.0	18.2	2.6	7.39	8.03	.008	...
18	.712	.660	.714	.6995	31.3	41.4	37.8	36.85	+ 6.42	.144	.187	.175	.169	81	72	77	76	N E b N	S E b S	N W b N	N 41 W	3.0	5.5	6.0	2.13	8.60	...	...
19	—	.959	—	—	—	33.8	—	—	—	—	.122	—	—	—	63	—	—	N W b N	E S E	N E b E	N 60 E	12.5	8.2	15.2	8.89	11.79	...	...
20	.737	.445	.338	.4812	31.3	42.1	41.0	39.02	+ 7.90	.115	.170	.218	.179	65	62	85	73	E b N	E N E	S W b W	N 69 E	23.4	15.5	2.2	5.47	12.69	.050	...
21	.322	.299	.354	.3267	35.6	35.6	32.0	34.08	+ 2.62	.151	.134	.135	.141	73	65	74	72	W b S	W S W	W b N	S 85 W	15.8	11.2	12.0	13.00	13.33	...	inap.
22	.414	.476	.487	.4548	29.8	32.7	29.8	30.90	— 0.93	.140	.120	.147	.134	84	64	88	78	W b S	W b N	Calm.	N 85 W	10.5	18.0	0.0	7.31	8.69	...	2.0
23	.354	.382	.573	.4440	25.5	28.0	23.7	25.73	— 6.45	.125	.131	.098	.117	91	86	77	84	N E b N	N W	W	N 58 W	6.0	7.2	10.6	6.69	8.51	...	0.2
24	.707	.746	.814	.7678	17.2	36.3	28.4	27.78	— 4.78	.081	.115	.119	.104	85	53	76	70	W	N W b W	W b N	N 73 W	5.0	13.0	7.0	9.57	9.85	...	...
25	.890	.862	.820	.8527	25.9	39.2	31.6	33.38	+ 0.45	.100	.103	.119	.110	70	42	66	58	W N W	S	N	N 61 W	6.0	9.0	4.6	2.43	5.45	...	...
26	—	.531	—	—	—	36.3	—	—	—	—	.140	—	—	—	65	—	—	N E b N	E N E	E b N	N 68 E	1.8	16.0	12.2	10.87	11.55	...	5.0
27	.139	.278	.446	.3048	31.3	36.7	34.2	34.17	+ 0.48	.160	.155	.152	.155	90	71	77	79	N	N W	N W b W	N 42 W	15.0	13.8	13.0	11.00	11.11	...	0.8
28	.606	.728	.817	.7267	30.6	38.1	30.9	33.13	— 0.92	.144	.126	.104	.123	85	55	60	66	N N W	N W b W	N b E	N 41 W	1.7	10.0	8.0	6.71	7.22	...	...
29	.762	.770	.702	.7535	24.8	40.7	33.8	34.53	+ 0.08	.112	.145	.166	.144	84	56	85	72	N N W	S S E	E b N	S 52 E	1.6	9.5	1.6	2.33	3.73	...	...
30	.646	.595	.636	.6220	32.4	45.4	38.9	39.93	+ 5.12	.161	.169	.151	.162	87	55	63	66	N E	N	N N W	N 19 W	2.4	5.6	15.0	6.98	8.64	...	...
31	.709	.736	.698	.7103	31.3	38.1	29.5	32.78	— 2.40	.144	.134	.136	.133	81	58	83	72	N	S S E	Calm.	N 44 E	11.5	3.2	0.0	1.39	3.45	...	...
	29.5500	29.5524	29.6004	29.5695	31.35	38.04	34.05	34.65	+ 4.68	.147	.157	.157	.154	82	68	79	76	.....	.....	.....	.....	7.77	11.68	5.85	.....	8.31	2.782	13.0

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MARCH, 1871

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.969 at 8 a.m. on 19th. } Monthly range=
Lowest Barometer .....29.074 from 6 a.m. and 6 a.m. on 3rd. } 0.895 inches.

Self-registering Ther.:
- Maximum temperature .....58°5 on 9th. } Monthly range=
- Minimum temperature.....17.0° on 24th. } 41°5
- Mean maximum temperature .....41°42 } Mean daily range=
- Mean minimum temperature .....28°89 } 12°23
- Greatest daily range .....21°5 from a.m. to p.m. of 24th.
- Least daily range ..... 3°4 from a.m. to p.m. of 21st.

Warmest day..... 9th; mean temperature.....45°05 }
Coldest day.....23rd; mean temperature.....25°73 } Difference=19°32.

Maximum { Solar..... 71°0 on 9th. } Monthly range=
Radiation { Terrestrial..... 5°5 on 24th. } 65°5.

Aurora observed on 5 nights, viz.:—17th, 18th, 24th, 28th and 31st.

Possible to see Aurora on 16 nights; impossible on 15 nights.

Snowing on 12 days; depth 13.0 inches; duration of fall 49.5 hours.

Raining on 8 days; depth, 2.782 inches; duration of fall, 64.0 hours.

Mean of cloudiness=0.70.

WIND.

Resultant direction, N. 31° W.; resultant velocity, 2.59.

Mean velocity, 8.31 miles per hour.

Maximum velocity, 28.2 miles, from 1.30 to 2.30 p.m. of 12th.

Most windy day, 6th; mean velocity, 13.82 miles per hour.

Least windy day, 4th; mean velocity, 2.77 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 12.19 miles per hour.

Least windy hour, 10 p.m.; mean velocity, 5.26 miles per hour.

Fog on 16th and 17th. First thunder Storm of season on the evening of 2nd.

Solar haloes recorded on 7th, 9th, 19th, 20th, 24th and 26th.

Lunar haloes recorded on 1st, 3rd, 4th, 5th, 6th, 29th and 30th.

13th, Ice broken up and mostly driven from Bay.

1st, Robins and Song Sparrows about. 10th, Blue Birds.

COMPARATIVE TABLE FOR MARCH.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°	°	
1843	21.3	— 8.2	39.9	— 2.5	42.4	2	0.625	18	25.7	...	...	1.18 lbs.
1844	31.3	+ 1.8	50.8	9.6	41.2	8	2.470	8	14.0	...	...	0.57
1845	35.4	+ 5.9	62.7	6.6	56.1	5	inap.	8	2.8	...	...	0.66
1846	33.1	+ 3.6	49.6	8.3	41.3	9	1.965	5	2.3	...	...	0.30
1847	26.2	— 3.3	43.9	5.6	38.3	5	0.850	6	4.2	...	...	0.71
1848	28.6	— 0.9	58.6	0.0	58.6	5	1.220	6	9.7	N 66 W	2.03	5.80 mls.
1849	33.5	+ 4.0	53.0	15.1	37.9	7	1.525	2	2.3	N 3 W	1.48	5.37
1850	29.8	+ 0.3	46.5	7.2	39.3	2	0.745	7	11.2	N 52 W	2.62	7.62
1851	32.4	+ 2.9	59.3	12.0	47.3	3	0.770	9	8.8	N 21 W	1.93	7.65
1852	27.7	— 1.8	44.8	— 7.4	52.2	8	3.080	12	19.5	N 8 W	0.71	5.81
1853	30.6	+ 1.1	56.3	0.0	56.3	6	1.080	8	7.1	N 58 W	2.60	5.96
1854	30.7	+ 1.2	55.1	7.4	47.7	9	2.425	3	2.8	N 53 W	3.39	8.03
1855	28.5	— 1.0	49.4	— 2.9	52.3	5	1.485	11	18.1	N 88 W	4.76	9.95
1856	23.1	— 6.4	41.4	—14.0	55.4	0	0.000	12	16.2	N 71 W	7.68	11.39
1857	27.8	— 1.7	57.6	— 5.5	63.1	4	0.335	15	11.3	N 63 W	6.63	10.84
1858	28.4	— 1.1	55.4	— 5.5	60.9	10	0.917	6	0.2	N 58 W	5.45	8.56
1859	36.3	+ 6.8	54.2	9.8	44.4	15	4.054	8	1.0	N 64 W	1.96	10.39
1860	34.5	+ 5.0	67.0	12.8	54.2	5	0.882	11	2.4	N 64 W	7.61	12.41
1861	26.9	— 2.6	47.4	— 5.2	52.6	8	2.125	14	7.1	N 54 W	4.33	10.56
1862	28.8	— 0.7	43.2	8.0	35.2	8	2.560	11	18.5	N 12 W	2.50	9.38
1863	25.8	— 3.7	42.2	— 4.0	46.2	4	0.687	17	11.4	N 27 W	2.62	9.27
1864	29.1	— 0.4	50.2	3.0	47.2	9	1.620	12	3.7	N 53 W	2.29	8.41
1865	33.6	+ 4.1	55.6	— 3.5	59.1	10	3.050	12	18.9	N 61 W	2.16	8.80
1866	27.6	— 1.9	45.8	7.5	38.3	8	1.915	18	7.2	N 73 W	6.84	11.51
1867	26.6	— 2.9	46.8	3.0	43.8	6	0.617	14	33.4	N 34 W	2.12	8.52
1868	31.3	+ 1.8	59.0	—15.6	74.6	7	2.660	5	4.2	N 21 W	2.12	8.58
1869	23.1	— 6.4	46.8	— 5.4	52.2	3	0.985	9	15.0	N 52 W	2.88	8.02
1870	26.3	— 3.2	44.0	5.2	38.8	2	0.755	18	62.4	N 18 E	4.73	10.13
1871	34.7	+ 5.2	58.5	17.0	41.5	8	2.782	12	13.0	N 31 W	2.59	8.31
Results to 1870.	29.52	.....	50.94	1.77	49.17	6.13	1.245	9.94	12.18	N 53 W	3.20	8.82
Exc. for 1871.	+ 5.13	.....	+ 7.56	+ 15.23	— 7.67	+ 1.87	+ 1.537	+ 2.06	+ 0.82	...	...	— 0.51

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—APRIL, 1871.

Latitude—43° 39′4 *North.* *Longitude*—*5h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.			Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°																			
1	29.581	29.428	29.342	29.4328	32.0	32.0	34.5	33.52	— 2.08	.13	.151	.192	.159	74	83	96	82	ENE	ENE	N b w	N 48 E	6.0	11.0	3.0	5.85	8.08	.040	1.2
2	—	.271	—	—		30.6	—	—	—	—	.184	—	—	—	75	—	—	w b s	s s e	N E b E	N 73 E	3.1	6.8	9.7	4.60	7.39	.070	...
3	.123	.146	.356	.2252	37.1	44.6	40.7	41.08	+ 4.72	.19	.253	.204	.223	86	86	80	86	N E b E	N	N W	N 21 W	9.4	2.6	21.6	5.04	7.75	.165	...
4	.501	.259	.486	.4285	33.4	59.4	39.9	44.55	+ 7.82	.17	.211	.112	.170	89	41	44	60	W	W b S	N W b W	N 76 W	3.6	31.5	28.5	16.45	19.62	...	...
5	.700	.734	.690	.7043	27.0	37.8	32.0	32.25	— 4.88	.09	.106	.135	.112	63	47	74	62	N W b N	S	Calm.	N 2 W	6.6	9.6	0.0	0.97	5.48	...	...
6	.631	.536	.436	.5188	29.1	42.5	36.7	36.82	— 0.68	.14	.130	.163	.144	87	47	75	67	N N E	E b N	W b N	N 69 E	5.8	12.6	3.5	5.55	6.73	...	...
7	—	.314	—	—	—	64.1	—	—	—	—	.395	—	—	—	66	—	—	N E b E	S b E	S W	S 30 W	1.0	6.6	9.5	5.50	6.23	...	...
8	.438	.431	.429	.4333	49.0	70.2	56.5	58.17	+19.88	.307	.318	.313	.309	88	42	68	65	S W	S W b S	S W b W	S 39 W	1.0	13.2	5.4	7.18	7.46	...	...
9	—	.442	—	—	—	71.0	—	—	—	—	.165	—	—	—	22	—	—	S W	S W b W	N W	S 74 W	5.3	19.2	19.7	9.00	12.09	...	...
10	.703	.599	.417	.5513	36.3	43.5	38.5	39.7[illegible]	+ [illegible]7	[illegible]	.150	.208	.175	74	52	89	72	N W b W	S S E	E N E	N 85 E	3.8	7.4	17.5	8.15	10.09	.510	...
11	.113	.014	.172	.0902	37.2	51.8	39.6	42.78	+ 3.37	.202	.311	.151	.209	93	80	61	75	E b N	S S E	W b S	S 61 W	13.0	2.0	19.6	7.47	13.19	.080	...
12	.177	.278	.293	.2510	37.0	44.6	42.5	41.85	+ 2.05	.149	.145	.190	.154	67	49	69	59	W S W	W b S	W b N	S 84 W	11.8	25.2	2.8	11.89	12.37	Inap.	0.1
13	.276	.283	.396	.3172	33.8	47.2	36.3	40.23	— 0.05	.144	.229	.140	.177	75	71	65	71	W b N	S S E	N W b N	N 66 W	1.0	6.4	4.0	3.97	5.52	.100	...
14	.381	.338	.405	.3727	29.8	42.8	36.0	37.40	— 3.17	.133	.177	.137	.147	80	64	65	66	Calm.	S S E	N W b N	N 46 W	0.0	7.0	10.0	6.41	8.83	...	...
15	.426	.475	.572	.4995	33.8	42.1	35.3	37.00	— 3.93	.144	.127	.127	.130	75	46	61	60	W N W	N W	N N W	N 43 W	11.5	11.5	8.2	10.52	10.90	...	...
16	—	.660	—	—	—	45.4	—	—	—	—	.162	—	—	—	52	—	—	N W	S S W	N W b N	N 53 W	7.1	10.0	7.5	6.27	8.38	...	...
17	.741	.716	.745	.7342	34.2	49.3	40.3	42.48	— 0.78	.152	.173	.116	.150	77	49	47	55	N N W	N W	N W b N	N 42 W	7.4	7.6	6.2	6.57	8.15	Inap.	...
18	.769	.690	.627	.6802	37.1	46.8	45.0	44.72	+ 2.67	.140	.151	.148	.148	64	46	49	50	N b E	E b N	E N E	N 74 E	4.0	6.0	12.2	10.84	11.04	.640	...
19	.506	.336	.223	.3337	43.9	43.9	46.8	45.30	+ 2.87	.189	.263	.295	.251	66	92	92	83	E b N	E b N	E N E	N 70 E	17.6	18.5	12.0	13.64	13.93	Inap.	...
20	.157	.160	.361	.2373	45.7	58.7	49.3	51.42	+ 8.60	.278	.264	.213	.251	90	52	59	66	N b W	S E	W S W	S 70 W	1.6	4.0	9.8	5.52	7.31	.008	...
21	.351	.357	.413	.3698	42.5	44.6	39.9	43.18	0.00	.227	.235	.198	.215	83	80	80	77	S W b S	Calm.	W b S	S 74 W	0.5	0.0	1.4	2.77	3.25	.010	...
22	.401	.459	.646	.5153	41.0	43.5	36.3	40.40	— 3.15	.237	.194	.176	.199	92	68	82	79	Calm.	N N W	W b N	N 72 W	0.0	14.4	13.5	11.27	11.61	..	...
23	—	.930	—	—	—	51.5	—	—	—	—	.117	—	—	—	30	—	—	W	N W b W	N W b N	N 65 W	10.8	23.0	4.3	10.73	11.94	...	...
24	30.110	30.000	.824	.9602	40.3	47.2	42.1	43.62	— 0.68	.158	.136	.161	.156	63	42	59	55	S E b E	E	E N E	S 89 E	3.2	7.4	4.4	4.45	5.28	.070	...
25	29.676	29.639	.689	.6635	40.7	53.3	43.5	46.48	+ 1.82	.170	.301	.142	.214	66	74	50	65	N b W	S S W	N N W	N 25 W	1.8	4.3	4.6	2.48	4.93	.520	...
26	.765	.746	.655	.7153	39.9	52.6	44.6	46.30	+ 1.28	.155	.148	.146	.141	62	36	49	45	N N E	E	E N E	N 74 E	6.0	17.0	15.8	13.53	13.73	1.025	...
27	.432	.345	.311	.3568	43.9	49.7	45.7	46.68	+ 1.27	.273	.333	.288	.301	95	93	94	94	E N E	S E b E	E N E	N 69 E	17.6	5.2	8.2	8.56	8.98	Inap.	...
28	.307	.295	.325	.3042	45.4	56.2	45.4	48.78	+ 3.02	.263	.275	.216	.253	86	60	70	74	E b N	S W b S	S E	S 25 W	6.0	13.6	1.0	5.20	6.42	.080	...
29	.267	.292	.358	.3067	45.0	47.9	46.1	46.15	+ 0.05	.269	.270	.273	.273	80	81	87	87	S W b S	S b W	Calm.	S 24 W	4.2	9.0	0.0	3.20	3.79		...
30	—	.385	—	—	—	55.1	—	—	—	—	.269	—	—	—	61	—	—	N W	S S W	N W b W	N 75 W	5.0	9.0	3.7	3.06	4.91		...
	29.4805	29.4394	29.4655	29.4584	38.13	48.01	41.40	42.95	+ 1.8[illegible]	.187	.210	.185	.194	79	62	69	69	.....	.....	.....	.....	5.86	10.72	8.92	...	8.85	3.448	1.3

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR APRIL, 871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.116 at 8 a.m. on 24th.
Lowest Barometer.....29.014 at 2 p.m. on 11th. } Monthly range= 1.102.

Self-registering Ther.
- Maximum Temperature .....72°8 on 8th.
- Minimum Temperature .....26°4 on 5th. } Monthly range= 46°4.
- Mean Maximum Temperature .....52°81.
- Mean Minimum Temperature .....35°57. } Mean daily range= 17°24.
- Greatest daily range.....31°3 from a.m. to p.m. of 7th.
- Least daily range ..... 7°6 from a.m. to p.m. of 22nd.

Warmest day.....8th...Mean Temperature.....58°17.
Coldest day .....5th...Mean Temperature.....32°25. } Difference=25°92.

Maximum Radiation.
- Solar ..... 94°0 on 8th.
- Terrestrial ..... 17°0 on 14th. } Monthly range= 77°0.

Aurora observed on 6 nights, viz.: 9th, 12th, 13th, 15th, 16th, and 17th.
Possible to see Aurora on 19 nights; impossible on 11 nights.
Snowing on 2 days; depth 1.3 inches; duration of fall 7.5 hours.
Raining on 17 days; depth 3.318 inches; duration of fall 76.1 hours.
Mean of Cloudiness, 0.71.

WIND.

Resultant Direction N. 48° W.; Resultant Velocity 1.86.
Mean Velocity 8.85 miles per hour.
Maximum Velocity 33.0 miles, from 4 to 5 p.m. of 4th.
Most Windy day 4th; Mean Velocity 19.62 miles per hour.
Least Windy day 21st; Mean Velocity 3.25 miles per hour.
Most Windy hour 3 p.m; Mean Velocity 12.26 miles per hour.
Least Windy hour 5 a.m.; Mean Velocity 5.35 miles per hour.

Fog on 1st and 3rd. Solar haloes 2nd, 5th and 8th.
Lunar haloes 3rd, 6th and 24th. Lightning alone April 7th.
Thunder storms 19th and 27th. Last Snow of season April 12th.
6th. Swallows seen. 7th. Butterflies.
7th. Frogs croaking. 3rd. Large flocks of Pigeons.

COMPARATIVE TABLE FOR APRIL

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°							
1843	40.9	— 0.2	71.6	14.7	56.9	7	3.185	3	0.1	...	...	0.46 lbs
1844	47.5	+ 6.4	74.6	14.9	59.7	10	1.515	1	Inap.	...	...	0.24
1845	42.1	+ 1.0	66.7	15.5	51.2	11	3.290	4	1.5	...	...	1.00
1846	44.0	+ 2.9	81.8	24.2	57.6	10	1.300	2	1.3	...	...	0.55
1847	39.2	— 1.9	65.1	9.3	55.8	8	2.870	2	4.0	...	...	0.59
1848	41.3	+ 0.2	65.1	22.7	42.4	5	1.455	1	0.5	N 77 W	1.46	4.89mls
1849	39.0	— 2.1	72.0	15.5	56.5	10	2.655	2	1.7	N 43 W	3.14	7.50
1850	37.9	— 3.2	65.7	18.0	47.7	7	4.720	2	1.1	N 39 W	1.12	7.64
1851	41.3	+ 0.2	59.3	25.8	33.5	11	2.295	3	1.2	N 14 E	2.52	8.07
1852	38.2	— 2.9	53.8	20.0	33.8	6	1.990	4	9.4	N 23 E	2.44	6.68
1853	41.9	+ 0.8	65.7	25.0	40.7	10	2.625	1	1.0	N 12 W	1.95	5.20
1854	41.0	— 0.1	64.5	20.2	44.3	12	2.685	4	2.7	N 50 E	2.57	6.81
1855	42.4	+ 1.3	69.4	10.7	58.7	8	2.030	3	1.6	N 36 W	3.99	7.57
1856	42.3	+ 1.2	72.2	14.2	58.0	13	2.780	3	0.1	N 29 E	1.64	6.05
1857	35.4	— 5.7	52.0	5.9	46.1	10	1.755	11	12.9	N 60 W	4.15	10.24
1858	41.5	+ 0.4	65.2	21.8	43.4	13	1.642	2	0.1	N 14 W	1.64	9.57
1859	39.5	— 1.6	64.8	22.6	42.2	9	2.527	8	1.2	N 36 W	2.33	10.79
1860	39.5	— 1.6	61.8	19.5	42.3	11	1.282	5	0.3	N 37 W	4.10	10.30
1861	42.0	+ 0.9	67.0	23.8	43.2	12	1.619	4	6.9	N 37 E	2.31	8.90
1862	39.6	— 1.5	68.0	14.5	53.5	10	2.235	4	0.2	N 50 E	2.48	9.77
1863	42.0	+ 0.9	69.0	8.6	60.4	8	2.210	4	1.6	N 14 E	3.75	9.20
1864	40.9	— 0.2	59.4	28.1	31.3	16	3.633	3	3.5	N 41 E	3.39	7.77
1865	43.1	+ 2.0	62.5	23.0	39.5	17	3.972	6	2.0	N 84 W	2.11	8.39
1866	43.9	+ 2.8	71.0	28.5	42.5	7	1.675	2	Inap.	N 42 W	3.34	7.95
1867	39.5	— 1.6	65.5	25.4	40.1	12	2.147	5	7.2	N 51 W	2.68	7.89
1868	38.0	— 3.1	64.0	9.2	54.8	7	0.990	10	5.3	N 63 W	2.43	9.24
1869	40.1	— 1.0	72.2	16.6	55.6	9	2.965	6	0.5	N 59 W	4.03	8.91
1870	44.6	+ 3.5	67.0	29.6	37.4	9	2.145	2	0.1	N 40 E	3.55	7.03
1871	43.0	+ 1.9	72.8	26.4	46.4	17	3.318	2	1.3	N 48 W	1.86	8.85
Results to 1870.	41.07	...	66.32	18.85	47.47	9.77	2.410	3.68	2.43	N 17 W	2.06	8.10
Excess for 71'	+ 1.88	...	+ 6.48	+ 7.55	— 1.07	+ 7.23	+ 0.908	— 1.68	— 1.13	...	...	+ 0.75

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MAY, 1871.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 P.M.	M'N	Excess of Mean above Normal.	Tension of Vapour. 6 A.M.	2 P.M.	10 P.M	M'N	Humidity of Air. 6 A.M.	2 P.M	10 P.M.	M'N	Direction of Wind. 6 A.M.	2 P.M	10 P.M.	Result't.	Velocity of Wind. 6 A.M.	2 P.M	10 P.M.	Result'.	MEN.	Rain in inches.	Snow in inches.
					°	°	°	°	°												°							
1	29.517	29.543	29.600	29.5557	46.1	55.8	49.7	50.08	+ 3.23	.254	.269	.226	.245	81	60	63	67	S E b S	S	N b E	S 79 W	0.5	5.4	6.0	1.33	4.37	...	...
2	.647	.643	.629	.6387	46.1	55.1	49.3	52.03	+ 4.88	.243	.296	.212	.259	78	70	59	66	N	E b S	E b N	N 79 E	7.5	8.2	13.2	10.38	10.76	...	...
3	.601	.604	.613	.6060	50.0	52.2	47.9	49.67	+ 2.12	.212	.184	.183	.185	59	46	54	51	E b N	E N E	E N E	N 65 E	14.5	16.6	20.2	17.63	17.75	.012	...
4	.503	.413	.414	.4367	42.1	42.5	44.6	43.07	— 4.83	.232	.263	.264	.259	85	97	90	93	E N E	E N E	N E b E	N 61 E	13.6	22.6	18.0	20.32	20.33	1.500	...
5	.360	.384	.449	.3992	41.7	46.4	44.6	44.63	— 3.63	.255	.278	.253	.265	96	88	86	90	E N E	E N E	W	N 49 E	13.5	6.2	2.0	3.73	4.77	.010	...
6	.425	.418	.425	.4202	45.0	51.1	45.0	46.37	— 2.33	.229	.227	.194	.220	90	60	65	70	N W b N	N W	N W	N 37 W	10.2	23.5	12.5	13.54	14.04	in p	...
7	—	.353	—	—	—	51.1	—	—	—	—	.132	—	—	—	35	—	—	N W	N W	W N W	N 55 W	10.2	35.0	11.1	15.21	15.48	...	...
8	.494	.541	.659	.5747	37.4	48.2	37.4	41.55	— 7.78	.162	.144	.162	.160	72	42	72	62	W N W	W N W	N W b N	N 52 W	9.4	15.0	5.5	11.18	11.42	...	...
9	.682	.680	.692	.6858	37.1	51.5	44.6	44.80	— 4.88	.174	.163	.162	.173	78	42	54	59	N N W	N W	N W b N	N 40 W	3.4	8.2	18.0	7.48	8.90	...	...
10	.732	.702	.688	.7098	40.7	53.3	47.5	47.47	— 2.58	.180	.159	.207	.186	69	38	62	57	N W b N	N W b N	N N W	N 32 W	9.0	20.3	3.5	8.49	8.66	...	...
11	.684	.583	.558	.5975	41.4	60.1	50.8	51.67	+ 1.27	.171	.293	.249	.240	64	54	67	63	W b N	S S W	S W b W	S 24 W	1.2	11.2	1.0	4.91	5.06	...	...
12	.542	.485	.476	.5018	47.5	65.9	56.9	57.48	+ 6.77	.264	.290	.183	.243	80	45	39	52	calm.	S E b S	S W b N	N 13 W	0.0	3.0	11.2	3.42	4.27	...	...
13	.638	.647	.699	.6772	47.9	52.2	44.3	47.88	— 3.22	.136	.183	.176	.166	40	46	60	49	N	S	N W b N	N 29 W	8.5	7.0	16.0	8.56	11.33	...	...
14	—	.651	—	—	—	54.7	—	—	—	—	.242	—	—	—	55	—	—	N b W	S b W	N W	N 61 W	7.8	8.0	7.0	6.63	8.40	...	...
15	.638	.587	.546	.5853	39.9	54.7	46.8	47.68	— 4.10	.163	.180	.198	.186	66	41	61	57	W	S b W	calm	S 30 W	3.0	11.2	0.0	3.15	3.81	...	...
16	.498	.295	.275	.3630	45.4	62.7	53.6	54.37	+ 2.23	.225	.287	.340	.295	74	50	82	69	W b S	S b W	W N W	S 73 W	1.5	9.5	6.6	6.56	8.94	.030	...
17	.515	.623	.762	.6507	44.6	52.2	44.6	46.62	— 5.87	.245	.127	.145	.169	83	32	49	53	N W b W	N W b W	N b W	N 40 W	17.6	19.0	5.0	11.56	11.97	...	...
18	.860	.857	.766	.8243	44.6	54.0	45.4	49.07	— 3.75	.172	.246	.215	.206	58	58	70	69	N b W	S	calm.	S 48 E	1.6	2.2	0.0	1.50	1.83	...	...
19	.758	.708	.646	.7100	46.8	67.4	52.9	55.40	— 2.23	.264	.354	.257	.286	82	52	63	66	calm	S b W	calm.	S 16 W	0.0	11.8	0.0	4.59	4.70	...	...
20	.659	.624	.634	.6360	56.2	77.8	67.0	67.60	+14.07	.316	.479	.423	.421	70	49	63	62	calm.	S S W	W N W	S 29 W	0.0	11.0	3.2	3.78	4.35	...	...
21	—	.509	—	—	—	76.0	—	—	—	—	.393	—	—	—	43	—	—	calm.	S b W	W N W	S 42 W	0.0	11.0	6.8	2.34	4.64	...	...
22	.529	.486	.568	.5317	56.5	69.5	51.5	59.65	+ 5.75	.378	.219	.203	.275	83	30	52	54	calm.	S E	N W	N 51 W	0.0	5.4	11.8	8.74	10.54	...	...
23	.706	.713	.771	.7445	46.4	60.1	48.2	51.58	— 2.97	.184	.128	.143	.157	58	25	46	44	N	N W b W	N N W	N 34 W	7.4	11.6	5.6	8.13	8.53	...	...
24	.913	.942	.858	.9042	45.7	60.1	47.2	52.20	— 2.77	.194	.210	.183	.201	62	40	56	51	N b E	S S E	E b N	S 88 E	9.5	6.6	2.0	2.92	4.46	...	...
25	.782	.626	.648	.6740	48.2	65.2	64.8	61.40	+ 6.17	.207	.345	.582	.404	60	55	95	71	E N E	S E b E	S W b W	S 30 W	0.8	5.0	1.0	2.71	5.08	.750	...
26	.678	.661	.694	.6818	61.6	75.7	65.2	67.62	+12.05	.532	.450	.408	.470	97	51	65	72	S W	W	W N W	N 87 W	0.5	7.0	7.0	3.47	4.50	...	...
27	.788	.826	.765	.7950	60.9	56.9	49.0	55.88	— 0.02	.343	.243	.197	.232	64	52	55	51	N b E	E	N E b N	N 72 E	5.5	6.6	5.3	5.76	6.55	...	...
28	—	.667	—	—	—	71.7	—	—	—	—	.463	—	—	—	60	—	—	N b E	S b E	W b S	S 20 E	0.6	4.6	0.7	1.01	1.54	...	...
29	.678	.607	.581	.6147	64.1	80.3	65.6	70.67	+14.12	.499	.626	.558	.562	83	60	88	75	S E b E	S S E	calm.	S	0.5	9.8	0.0	2.39	3.71	...	...
30	.599	.648	.555	.5677	67.4	78.5	75.7	74.58	+17.72	.575	.620	.607	.618	85	63	68	73	calm.	S	N W	S 48 W	0.0	7.0	4.2	1.99	2.97	inap	...
31	.581	.608	.640	.6137	68.8	77.8	66.3	70.72	+13.55	.612	.593	.444	.554	87	63	68	74	W	E b S	N E	N 70 E	0.8	6.0	3.2	4.02	5.09	...	...
	29.6299	29.6057	29.6152	29.6185	48.89	60.27	52.09	54.15	+ 2.06	.276	.291	.273	.283	74	52	65	63	.....	.....	.....	.....	5.12	10.82	6.70	.....	7.70	2.30	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MAY, 1871

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.952 at 8 a.m. on 24th. } Monthly range=
Lowest Barometer.....29.265 at 4 p.m. on 16th. } 0.687 inches.

Self-registering Ther.
- Maximum temperature .....85°0 on 30th. } Monthly range=
- Minimum temperature.....32.4 on 15th. } 52°6
- Mean maximum temperature .....63°67 } Mean daily range=
- Mean minimum temperature .....43°93 } 19°74
- Greatest daily range .....32°2 from a.m. to p.m. of 20th.
- Least daily range ..... 6°6 from a.m. to p.m. of 4th.

Warmest day.....30th; mean temperature.....74°58 }
Coldest day..... 8th; mean temperature.....41°55 } Difference=33°03.

Maximum Radiation
- Solar ..... 98°4 on 31st. } Monthly range=
- Terrestrial..... 21°8 on 15th. } 76°,6

Aurora observed on 9 nights, viz.:—8th, 12th, 13th, 14th, 19th, 20th, 22nd, 24th and 26th.

Possible to see Aurora on 24 nights; impossible on 7 nights.

Raining on 7 days; depth, 2.302 inches; duration of fall, 35.4 hours.

Mean of cloudiness=0.48.

WIND.

Resultant direction, N. 23° W.; resultant velocity, 2.53.

Mean velocity, 7.70 miles per hour.

Maximum velocity, 35.0 miles, from 1.30 to 2.30 p.m. of 7th.

Most windy day, 4th; mean velocity, 20.33 miles per hour.

Least windy day, 28th; mean velocity, 1.54 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 10.89 miles per hour.

Least windy hour, 4 a.m.; mean velocity, 4.55 miles per hour.

Fog recorded on 5th, 12th, 25th, 26th and 30th. Dew, on 11th, 12th, 15th, 16th, 24th, 27th and 30th.

Frost, on 2nd, 6th, 7th, 8th and 9th. Thin ice on 8th.

Thunder Storm on 25th. Lightning alone, 30th.

Solar haloes, 16th, 19th, 23rd and 27th. Lunar haloes, 2nd, 23rd and 26th.

Sunday, 21st, at 1 a.m., a smart shock of an earthquake felt.

COMPARATIVE TABLE FOR MAY.

YEAR	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction	Velocity.	Mean Velocity.
	°	°	°	°	°					°	°	
1843	49.1	— 2.5	79.8	29.2	50.6	5	1.570	0	0.0	...	...	0.52 lbs.
1844	53.6	+ 2.0	78.4	28.7	49.7	14	5.670	0	0.0	...	...	0.39
1845	49.6	— 2.0	77.8	27.8	50.0	8	2.300	0	0.0	...	...	0.55
1846	55.5	+ 3.9	79.7	33.1	46.6	9	4.375	0	0.0	...	...	0.46
1847	54.4	+ 2.8	72.1	26.7	45.4	12	2.040	0	0.0	...	...	0.29
1848	54.1	+ 2.5	78.0	31.3	46.7	13	2.520	0	0.0	N 40 W	1.31	4.93mls.
1849	48.0	— 3.6	72.2	27.9	44.3	16	5.115	0	0.0	N 51 E	1.97	5.33
1850	47.6	— 4.0	77.8	27.5	50.3	7	0.545	1	inap	N 64 W	2.05	6.32
1851	51.3	— 0.3	73.3	28.0	45.3	12	2.950	1	0.5	N 32 W	1.59	6.34
1852	51.4	— 0.2	73.3	32.0	41.3	7	1.125	1	inap	S 82 W	0.93	4.00
1853	50.9	— 0.7	78.4	32.2	46.2	17	4.420	1	inap	N 2 W	6.82	5.16
1854	52.2	+ 0.6	71.4	25.2	46.2	11	4.630	0	0.0	E	0.40	5.38
1855	53.1	+ 1.5	77.5	33.0	44.5	6	2.565	2	0.9	N 1 W	2.76	5.93
1856	50.5	— 1.1	82.2	31.2	51.0	14	4.580	1	inap	N 4 E	3.99	9.81
1857	48.9	— 2.7	74.8	26.0	48.8	15	4.145	1	inap	N 23 W	1.14	8.13
1858	48.9	— 2.7	69.8	31.0	38.8	17	6.367	0	0.0	N 42 E	3.35	9.30
1859	55.2	+ 3.6	79.6	39.5	40.1	11	3.410	0	0.0	N 72 E	1.59	5.70
1860	55.5	+ 3.9	74.5	32.5	42.0	16	1.815	0	0.0	N 26 E	2.66	7.17
1861	50.8	— 4.1	73.0	28.0	45.0	12	3.380	1	0.5	N 47 W	3.60	9.17
1862	47.5	+ 0.6	73.5	32.4	46.1	8	1.427	0	0.0	N 52 W	2.80	7.87
1863	52.2	+ 2.7	79.0	36.4	42.6	14	3.363	1	0.1	N 56 E	0.41	5.89
1864	54.3	+ 3.2	79.0	32.2	46.8	18	4.070	0	0.0	N 7 W	1.86	5.64
1865	54.8	+ 0.7	79.0	30.0	49.0	11	4.005	0	0.0	N 3 W	1.65	5.48
1866	52.3	— 3.3	73.4	33.4	40.0	13	2.820	0	0.0	N 46 W	4.49	9.26
1867	48.3	— 5.1	65.0	24.6	40.4	18	3.220	1	inap	N 51 W	3.55	8.40
1868	46.5	+ 0.2	73.0	33.2	39.8	16	7.670	0	0.0	N 38 E	5.10	6.87
1869	51.8	— 0.8	74.2	31.4	42.8	16	2.805	1	inap	N 20 W	2.38	6.55
1870	56.3	+ 4.7	81.2	38.8	42.4	10	1.150	0	0.0	N 23 E	1.09	5.48
1871	54.2	+ 2.6	85.0	32.4	52.6	7	2.302	0	0.0	N 23 W	2.53	7.70
Results to 1870	51.55	.....	75.93	30.83	45.10	12.03	3.285	0.39	0.07	N 11 W	1.66	6.70
Exc. for 1871	+ 2.60	.....	+ 9.07	+ 1.57	+ 7.50	— 5.03	— 0.983	— 0 39	— 0.07	...	...	+ 1.00

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JUNE, 1871.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 P.M	M'N.	Excess of Mean above Normal.	Tension of Vapour. 6 A.M	2 P.M.	10 P.M.	M'N.	Humidity of Air. 6 A.M	2 P.M.	10 P.M.	M'N.	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Res'l-tant	MEAN	Rain in inches	Snow in inches.
					°	°	°	°	°																			
1	29.686	29.654	29·627	29.6572	65.4	78.9	61.9	69.00	+11.50	·521	.614	.477	.533	83	62	86	75	N E	s b E	E b N	S 66 E	1.2	3.2	1.0	2.30	3.08	...	...
2	.657	.624	.592	.6188	64.8	80.0	68.4	72.03	+14.23	.515	.629	.575	.586	83	61	83	75	Calm.	S E	N E	S 47 E	0.0	4.6	4.2	1.46	2.46	...	...
3	.630	.594	.582	.5992	67.0	77.8	69.5	72.35	+14.22	.581	.675	.647	.634	88	71	90	81	S S W	s w b s	N W	S 36 W	1.5	11.8	1.8	4.04	5.75	...	...
4	—	.560	—	—	—	80.3	—	—	—	—	.755	—	—	—	73	—	—	N b W	S S W	N b W	N 12 W	6.5	5.6	9.8	4.18	6.12	...	...
5	.659	.638	.567	.6137	67.7	71.7	63.4	67.83	+ 9.07	.323	.397	.323	.334	48	52	55	49	N b E	S E	N N E	N 74 E	7.8	7.5	5.5	4.26	5.40	...	...
6	.513	.374	.291	.3860	63.4	71.7	69.9	69.47	+10.38	.431	.463	.626	.509	74	60	86	71	N b E	E b S	W b N	S 43 E	3.6	10.0	7.0	3.39	7.15	.440	...
7	.203	.251	.346	.2760	69.2	78.2	61.6	70.02	+10.64	.480	.360	.417	.473	95	37	76	66	S w b W	W b S	Calm	S 84 W	2.6	22.0	0.0	7.99	8.34	...	...
8	.416	.480	.664	.5317	63.0	65.6	49.3	59.05	— 0.68	.437	.294	.231	.314	75	47	65	62	W S W	W N W	W N W	N 73 W	2.2	26.5	23.8	12.62	13.03	...	...
9	.748	.795	.755	.7693	50.4	62.3	53.3	55.62	— 4.42	.279	.348	.312	.309	76	62	76	70	N W	S	S W b S	S 47 W	10.0	10.0	2.5	2.58	5.80	...	...
10	.666	.375	.448	.4867	52.9	71.7	58.7	61.10	+ 0.73	.338	.505	.467	.450	84	64	95	84	E	S W	S W b W	S 28 W	6.0	15.0	1.0	3.11	5.47	.570	...
11	—	.236	—	—	—	70.6	—	—	—	—	.401	—	—	—	53	—	—	S W b W	W S W	W N W	S 86 W	3.2	16.0	2.5	5.06	6.26	inap.	...
12	.260	.269	.284	.2722	53.6	62.7	50.8	56.12	— 4.88	.287	.275	.313	.306	69	48	84	69	W b S	W b N	Calm	N 81 W	6.0	25.0	0.0	11.29	12.65	.060	...
13	.042	.217	.430	.2408	54.0	58.0	47.9	53.83	— 7.50	.367	.283	.268	.305	88	58	81	75	S W	W	W	N 89 W	3.0	22.0	3.6	13.42	13.57	...	...
14	.479	.450	.526	.4882	48.6	65.9	52.9	56.87	— 4.80	.292	.290	.306	.299	85	45	76	67	W	W b N	N W b W	N 77 W	4.6	17.0	7.0	5.78	6.67	.040	...
15	.578	.571	.660	.6098	50.8	62.7	49.0	54.37	— 7.62	.293	.330	.225	.289	78	58	65	68	W N W	N N E	N W	N 12 W	4.0	8.0	4.8	4.36	6.84	.095	...
16	.722	.699	.747	.7273	46.8	60.1	47.9	53.17	— 9.13	.253	.309	.259	.276	79	59	77	68	N W b W	S	N E	N 14 E	9.0	9.0	2.0	0.92	6.29	...	...
17	.738	.630	.478	.6030	49.0	59.0	61.6	57.32	— 5.28	.253	.226	.257	.259	73	45	46	55	N E	E N E	E N E	N 64 E	5.6	16.0	18.6	11.20	11.65	.250	...
18	—	.449	—	—	—	65.9	—	—	—	—	.554	—	—	—	87	—	—	E N E	S E	Calm.	N 47 E	6.8	9.2	0.0	1.06	3.32	.010	...
19	.490	.453	.504	.4800	56.2	74.9	62.3	65.20	+ 1.98	.417	.576	.484	.479	93	66	86	77	Calm	S S W	Calm.	S 55 W	0.0	6.5	0.0	3.57	4.87	...	...
20	.494	.580	.598	.5652	58.0	58.3	56.9	58.57	— 4.95	.326	.412	.319	.346	67	84	68	69	Calm.	W	N W b W	N 74 W	0.0	6.2	10.4	5.00	6.49	.220	...
21	.749	.765	.745	.7580	56.2	64.5	55.1	58.95	— 4.85	.305	.342	.256	.300	68	56	58	59	N b W	S	N W b N	N 33 W	9.2	9.6	1.5	0.74	4.74	...	...
22	.715	.600	.564	.6203	50.4	68.8	53.0	61.58	— 2.52	.257	.386	.422	.370	70	55	73	67	N b W	S E b S	W S W	S 36 W	4.0	13.0	3.5	3.54	6.49	...	...
23	.621	.615	.557	.5892	59.4	64.8	59.4	61.63	— 2.75	.352	.425	.375	.370	69	69	74	67	N N W	S	N E b E	N 61 E	5.4	1.2	0.8	2.57	4.80	.505	...
24	.503	.533	.640	.5545	52.6	63.4	52.9	55.88	— 8.73	.375	.393	.296	.350	94	67	74	78	E N E	N E	N N W	N 54 E	15.0	9.6	4.2	5.85	7.59	.270	...
25	—	.766	—	—	—	69.5	—	—	—	—	.465	—	—	—	64	—	—	N b W	S S E	N W	S 16 W	3.2	4.4	2.7	0.90	2.54	...	...
26	.700	.653	.595	.6412	59.8	74.9	67.4	68.43	+ 3.30	.405	.503	.430	.447	78	58	64	65	Calm.	S	S S W	S 24 W	0.0	6.5	3.0	2.55	3.15	...	...
27	.490	.343	.368	.4032	64.5	76.0	59.4	66.58	+ 1.20	.454	.634	.422	.511	75	70	83	78	S W b W	S b W	S W b W	S 47 W	0.5	15.8	2.5	4.51	6.10	.880	...
28	.338	.291	.386	.3417	58.7	71.0	55.1	61.35	— 4.30	.361	.383	.320	.345	73	50	74	65	N W b N	W b N	W N W	N 69 W	11.5	15.0	7.0	7.45	8.54	...	...
29	.479	.576	.656	.5820	52.6	59.1	47.5	53.00	—12.87	.310	.216	.445	.240	78	43	74	63	N W	N W	Calm	N 47 W	13.3	15.0	0.0	6.72	6.75	inap.	...
30	.724	.713	.677	.7057	49.3	63.4	56.2	56.85	— 9.27	.270	.310	.295	.274	77	53	65	60	Calm.	S b E	N E b E	S 31 E	0.0	10.6	3.2	2.47	4.97	...	...
	29.5496	29.5556	29.5495	29.5431	57.09	67.90	57.74	61.39	— 0.62	.372	.407	.368	.382	78	58	74	69	.....	.....	.....	.....	4.86	11.71	4.46	.....	6.57	3.340	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JUNE, 1871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.795 at 8 a.m. and 2 p.m. on 9th. } Monthly range=
Lowest Barometer.....29.039 at 8 a.m. on 13th. } 0.756

Self-registering Ther.
- Maximum temperature .....83°0 on 2nd & 4th. } Monthly range=
- Minimum temperature .....41.2 on 30th. } 41°8
- Mean maximum temperature .....71°47 } Mean daily range=
- Mean minimum temperature.....52°17 } 19°30
- Greatest daily range..... 29°6 from a.m. to p.m. of 10th.
- Least daily range.....8°2 from a.m. to p.m. of 29th.

Warmest day..... 3rd; mean temperature 72°35 } Difference=19°35
Coldest day.....29th; mean temperature 53°00 }

Maximum Radiation { Solar.....100°6 on 4th. } Monthly range= 68°8
Terrestrial.....31°8 on 9th & 16th. }

Aurora observed on 5 nights, viz.: 7th, 10th, 17th, 18th and 20th.

Possible to see aurora on 24 nights; impossible on 6 nights.

Raining on 13 days; depth, 3.340 inches; duration of fall, 42.3 hours.

Mean of cloudiness=0.46.

WIND.

Resultant direction, N. 80° W.; Resultant velocity, 2.04.

Mean velocity, 5.57 miles per hour.

Maximum velocity, 31.5 miles, from 9 to 10 a.m. of 13th.

Most windy day, 13th; mean velocity, 13.57 miles per hour.

Least windy day, 2nd; mean velocity, 2.46 miles per hour.

Most windy hour, 2 p.m.; mean velocity, 11.73 miles per hour.

Least windy hour, 11 p.m.: mean velocity, 3.39 miles per hour.

Solar haloes on 17th, 19th and 23rd.

Lunar corona on 2nd.

Thunder heard 3rd, 4th, 10th, 15th and 27th.

Rainbows on 4th and 14th.

Hoar Frost on the mornings of the 16th and 17th.

COMPARATIVE TABLE FOR JUNE.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1843	58.4	— 3.2	83.3	28.2	55.1	12	4.595	.....	.....	...	...	0.27 lbs
1844	59.9	— 1.7	83.3	33.2	50.1	9	3.535	.....	.....	...	...	0.19
1845	61.0	— 0.6	84.6	38.5	46.1	11	3.715	.....	.....	...	...	0.27
1846	63.3	+ 1.7	84.2	39.1	45.1	10	1.920	.....	.....	...	...	0.32
1847	58.4	— 3.2	77.8	36.7	41.1	14	2.625	.....	.....	...	...	0.30
1848	62.9	+ 1.3	92.0	37.4	54.6	8	1.810	.....	.....	N 61 W	1.90	4.51 m.
1849	63.2	+ 1.6	84.4	35.2	49.2	7	2.020	.....	.....	S 71 E	0.49	3.32
1850	64.3	+ 2.7	85.6	34.2	51.4	10	3.345	.....	.....	S 60 W	0.38	4.54
1851	59.2	— 2.4	79.2	37.0	42.2	11	2.695	.....	.....	S 2 W	1.26	4.42
1852	60.8	— 0.8	86.1	37.2	48.9	10	3.160	.....	.....	S 76 W	1.49	4.09
1853	65.5	+ 3.9	89.5	39.2	50.3	9	1.550	.....	.....	N 1 W	0.10	3.73
1854	64.1	+ 2.5	92.5	35.2	57.3	9	1.460	.....	.....	N 24 E	0.71	4.15
1855	59.9	— 1.7	91.5	36.2	55.3	17	4.070	.....	.....	N 69 W	1.33	5.70
1856	62.1	+ 0.5	89.2	42.0	47.2	13	3.200	.....	.....	S 21 W	0.90	5.30
1857	56.9	— 4.7	76.0	35.0	41.0	21	5.060	.....	.....	N 49 W	1.15	7.60
1858	66.2	+ 4.6	90.2	42.5	47.7	12	2.943	.....	.....	S 20 E	0.25	5.53
1859	58.3	— 3.3	86.4	32.2	54.2	16	4.080	2	inapp	N 77 E	1.95	7.19
1860	63.2	+ 1.6	81.6	49.2	32.4	14	2.136	.....	.....	N 44 W	3.13	7.01
1861	61.3	— 0.3	87.8	41.6	46.2	13	2.329	.....	.....	N 39 W	2.29	6.11
1862	60.5	— 1.1	85.4	39.4	46.0	10	1.007	.....	.....	N 26 W	1.77	5.98
1863	60.1	— 1.5	84.8	37.4	47.4	13	1.662	.....	.....	N 50 W	2.26	5.24
1864	63.0	— 1.4	93.4	34.8	58.6	5	0.570	.....	.....	N 55 W	1.72	4.55
1865	64.5	+ 2.9	90.2	43.0	47.2	7	2.005	.....	.....	S 30 W	0.60	4.06
1866	60.2	— 1.4	90.5	40.0	50.5	15	2.720	.....	.....	S 15 W	0.71	5.09
1867	64.3	+ 2.7	88.6	44.0	44.6	8	0.885	.....	.....	S 84 E	0.48	4.13
1868	62.0	+ 0.4	84.2	38.0	46.2	11	2.217	.....	.....	N 16 E	0.85	5.26
1869	58.4	— 3.2	81.4	36.4	45.0	22	4.373	.....	.....	N 80 W	1.77	5.23
1870	67.3	+ 5.7	88.4	50.0	38.4	16	8.090	.....	.....	N 17 E	0.40	5.14
1871	61.4	— 0.2	83.0	41.8	41.2	13	3.340	.....	.....	N 80 W	2.04	6.57
Results to 1870.	61.62	.....	86.14	38.31	47.83	11.87	2.906	.....	.....	N 62 W	0.78	5.15
Excess for '71.	— 0.23	.....	— 3.14	+ 3.49	— 6.63	+ 1.13	+ 0·374	.....	.....	...	...	+ 1.42

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Sketch–Section across the Island of Grand Manan: Bay of Fundy.

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THE CANADIAN JOURNAL.

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RIGHTHANDEDNESS.

BY DANIEL WILSON, LL.D.,

PROFESSOR OF HISTORY AND ENGLISH LITERATURE IN UNIVERSITY COLLEGE, TORONTO.

(*Read before the Canadian Institute 27th January*, 1871.)

One after another of the assumed specialities of man, and his claims to a distinct classification in animated nature, is being ruthlessly swept away, in the marvellous revolutions of modern science. Hächel discusses the steps by which he became a biped. Darwin follows down, from "an extremely remote period, his half-human ancestors," transforming the imitative growl of the first unusually wise ape, into the varied tones and cadences of the impassioned human orator. Cuvier's assumption for man of a distinct order, equally apart from Quadrumana, and Cheiroptera, as from Brachiopoda or Gasteropoda, has long since been challenged; and as for his *Bimana*, it is less in favour now than his classification of the medieval Devil, by means of the indispensable horns, tail and hoofs, as "a graminivorous animal." The most conceded to his *Bimana* in the levelling process of scientific revolution, is a place in the same order with *Quadrumana*, under a common title of Primates. Can anything more definite be made of an order of *Unimana?* Is man, with only rare and purely exceptional cases, right-handed; and does he alone, and invariably, manifest this preferential use of the right limb? The answer to those questions may prove to have a value in relation to more comprehensive enquiries.

The human hand is unquestionably the most perfect of hands, whatever be its relation to inferior developments of a similar organ. The wonderful complexity of its structure, its nice delicacy of touch, and its adaptation in all ways for being the organ of an intelligent volition, fitted for the execution of every requirement of ingenuity and skill, alike suggest its recognition as one special and distinctive feature of man's organization. The hand of the monkey is a locomotive, as well as a prehensile organ; whereas the differences between the hand and foot of man point to essentially diverse functions for each. The short, weak thumb, the long, nearly uniform fingers, and inferior play of the wrist, are advantageous to the tree-climber, and pertain to the hand as an organ of locomotion; whereas the absence of all such qualities in the human hand secures its permanent delicacy of touch, and its general adaptation for all manipulative purposes.

There are, however, unquestionably, traces of prehensile capacity in the human foot; and even of remarkable adaptability to certain functions of the hand. Well-known cases have occurred, of persons born without hands, or early deprived of them, learning to use their feet in many delicate operations, including not only the employment of pen and pencil, but the use of scissors, with a facility which still more strikingly indicates the separate action of the great toe, and its thumb-like apposition to the others. Still the human foot is not a hand. The small size of the toes, as compared with the fingers, and the position and movements of the great toe, alike point to diverse functions, and a greatly more limited range of action in the normal use of the toes. But the latent capacity of the system of muscles of the foot—scarcely less elaborate than that of the hand,—is obscured to us by the rigid restraints of the modern shoe. The power of voluntary action in the toes manifests itself not only in cases where early mutilation, or malformation at birth, compels the substitution of the foot for the hand; but among savages, where the unshackled foot is in constant use in climbing, and feeling its way through brake and jungle, the same free use of the toes, and especially the power of separating the great toe from the others, which may be seen in the involuntary movements of a healthy child, is retained. A very brief experience of the soft, yielding deer-skin moccasin of the Red Indian, in place of the rigid European shoe, restores even to the unpractised foot of the white man a freedom of action in the toes, a discriminating sense of touch, and a capacity for grasping rock or tree in walking or climbing, such as he had no concep-

tion of before. In the extreme case of the substitution of the foot for the hand, I have myself seen a woman, born without hands, execute elaborate pieces of scissor-work, and write not only with neatness, but — to apply the term adapted to perfect handiwork, — with great dexterity.

But while such evidence shows a capacity of development of the human foot for manipulative purposes, it very slightly affects the manifest diversity of functions indicated in the separate movements of the radius on the ulna, as contrasted with the fixity of the tibia and fibula; the distinction in form and action of the thumb and great toe; and the diverse articulations of the hand and foot in relation to the arm and leg. The human hand, as an instrument of constructive ingenuity and artistic skill, stands wholly apart from all the organs applied to the production of analogous workmanship among the lower animals. Man only, in any strict sense, is a manufacturer. Where the constructive ingenuity of the lower animals brings them into comparison with him, the arts of the instinctive weaver or builder owe none of their approximation to human workmanship to the development of an organ of manipulation.

Nevertheless, though the Quadrumana claim no place among the instinctive architects, weavers, or spinners, their hands place them in some respects at a decided advantage over other mammals. Imperfect as they are, and unfitted for the delicate operations in which man's hand executes the conceptions of his mind, they suffice for all the limited requirements of the forest-dweller. In climbing trees, as in seizing a small stick, or any other object which he can grasp, the monkey uses the thumb and finger as man does. It thus accomplishes all needful manipulations in the search for food: gathering and shelling nuts or pods, opening shell-fish, tearing off the rind of fruit, or pulling up roots. In picking out thorns or burs from its own fur, or in the favourite occupation of hunting for each other's parasites, the monkey uses the finger and thumb; and in many other operations, performs with the hand, what is executed by the quadruped or bird less effectually by means of the mouth or bill.

At first sight, we might be tempted to assume that the four-handed mammal had the advantage of us; as there are certainly many occasions when an extra hand could be turned to useful account. But not only do man's two hands prove greatly more serviceable for all the higher purposes of manipulation than the four hands of the ape; but as he

rises in the scale of intellectual superiority, he seems as it were to widen still further this difference in proportionate manipulative appliance, and to convert one hand into the special organ and servant of his will; while the other is relegated to a subordinate place, as its mere aider and supplement.

We have thus a progressive scale, from the imperfectly developed, on to the perfectly educated hand: all steps in its adaptation to the higher purposes of the manipulator. The hand of the rude savage, of the sailor, the miner, or blacksmith, while well fitted for the work to which it is applied, is a very different instrument from that of the chacer, engraver, or cameo-cutter; of the painter or sculptor. The latter, indeed, is unquestionably a result of development, whatever the other may be; for, as we have in the ascending scale the civilized and educated man, so also we have the educated hand as one of the most characteristic features of his civilization.

But so soon as attention is directed to the educated hand, the distinction of right and left-handedness acquires prominent importance. Whence does it arise? If it be the result of any organic structure, dependent, for example, on the relative disposition of the viscera, or of the great arteries of the upper limbs, we should look for some indications of it among the lower animals, and especially among the Quadrumana. But it has scarcely yet been studied even in the intermediate stage of savage man.

Where the subject has attracted any notice, the universality of right-handedness has been assumed, except in purely abnormal manifestations; and too frequently any disposition to deviate from it in childhood is treated as a bad habit, if not indeed as something nearly allied to perverse moral delinquency. But any evidence of the existence of right-handedness generally among savage races is exceedingly vague. In the rude manipulations of a purely savage life, the imperfection of the tools, and the general absence of combined operations, the distinction in the use of one hand rather than the other is of little importance. In digging roots, climbing rocks or trees, in the rude operations of the primitive boat-maker or hut-builder; in hunting, flaying, cooking, or most other of the operations pertaining not only to the hunter, but also to the pastoral stage: there is little manifest motive for the use of one hand more than the other; and on the supposition of either becoming more generally serviceable, it would attract no notice, nor interfere in any degree with the arts of life, though some gave a preference to the

right hand and others to the left. There are involved in it the two elements of a preference dependent on organic structure and consequent special adaptability; and a deliberate choice and education of one hand, as the result of a recognition of the convenience and facility to be derived from righthandedness. Of the former we have traces among the lower animals. In the case of dogs, for example, it may be noticed that they rarely move in the direct line of their own body, but incline to the right or left, so that the right hind-foot steps into the place of the left fore-foot, or *vice versa*. Horse-trainers could probably furnish facts relative to its natural action, indicating a use of the limbs of one side more promptly than the other. We readily recognize in the horse, as in other quadrupeds, a regular alternation in its paces, but modified by education for the various requirements of man. In the case, for example, of a horse, regularly trained for a lady's use, the action is as much the result of education, as that of one taught to perform in the circus, or drilled for combined action in military evolutions. It is to be noted, however, that the fashion of a lady's side-saddle has by no means been so uniform as to connect it with a universal righthandedness. The uniform custom at present is for a lady in riding to sit on the left side of her horse, holding the reins in the left hand, with the right disengaged for the free use of the whip or switch. But in Anglo-Saxon MSS, ladies are represented riding on the right side of the horse; and according to Mr. Thomas Wright, this continued down to about the time of Henry VIII. His two royal daughters, Mary and Elizabeth, are both represented on their great seals riding according to modern usage, on the left side. A correspondent of *Notes and Queries* states that it was very recently, and probably still is, the practice in Brazil, for a lady to sit on the right side of her horse. Such variations in usage or fashion show how readily universal custom may be mistaken for a natural law.

The elephant is affirmed by some to betray a strongly marked right-sidedness. One writer in *Nature* (April 14th, 1870,) specially refers to it as known to employ one tusk in preference to the other in rooting, &c. But the analogy is of doubtful application to the present enquiry, even though the action could be proved to indicate a constant preference. I observe in a fine specimen of a walrus skull recently added to the museum of the University of Toronto, that the left tusk is longer, larger, and more massive than the right one.

That a disposition to employ one limb in preference to another is observable in some of the lower animals, is, I think, undoubted. How

far it is general, or only exceptional, has yet to be determined by observation; but that action equivalent to righthandedness can be taught such animals as the dog, horse, or elephant, easily enough, is too obvious to be dwelt upon. I have found no difficulty in teaching a favourite dog to give the right paw when asked, and readily to discriminate between it and the left. But if the assumed universality, or general prevalence of righthandedness, is to be ascribed to organic structure, consequent on the disposition of the arteries, the heart, &c., then traces of the same ought to be common in the lower animals, and manifested among all savages. If, on the contrary, it is solely acquired, as a habit engendered by the frequent occasions in which man has to use the limbs of the two sides independently, and to give the preference uniformly to one or other in combined action, then it is scarcely conceivable that all nations, ancient and modern, savage and civilized, should be found, undesignedly, and without concert, selecting the limbs of the same side. But in this, as in so many other enquiries, the premises have been more or less taken for granted. Professor Buchanan, in his "Mechanical Theory of the Predominance of the Right Hand over the Left," starts with this assumption: "The use of the right hand in preference to the left must be regarded as a general characteristic of the family of man. There is no nation, race or tribe of men on the face of the earth at the present day, among whom this preference does not obtain; while, in former times, it is shown to have existed, both by historical documents and by the still more ancient and authentic testimony of certain words, phrases, and modes of speaking, which are, I believe, to be found in every spoken language." This assumes much which is probably true, but of which, thus far, we have no proof.

It is a piece of inconsequential reasoning to infer from the preference for one hand over another, of which the evidence is abundant in many languages, ancient and modern, that therefore the choice has invariably been of the same hand. This is, in many cases, a mere inference. We may legitimately enough translate the terms applied to the favourite hand by that of *right hand*, without thereby assuming that it invariably pertained to the same side. Manifestly in the sense of dexterity, righthandedness would be everywhere assigned to the side preferred by common consent or usage. Practically, the most useful member of the left-handed man is *his* "right hand," though it be on what is styled by the majority the left side, and no one would regard it as a misap-

plication of language to speak of any specially skilful use of it as an act of dexterity.

But the whole enquiry has to be reviewed *ab initio*, and various questions involved in it invite reconsideration. Is the superiority of the right hand over the left innate and congenital? Are there organic or constitutional reasons for the general preference? Or is it solely the result of acquired habit, consequent on the recognised convenience of simultaneous uniformity of action among members of the same community? A further question of considerable interest also invites inquiry, viz.: Is right or left handedness, however acquired, transmitted hereditarily?

The statistics of this enquiry have yet to be collected. Very different opinions have been expressed as to the proportion of left to right-handedness, and such evidence as exists seems to point to considerable variations in this respect at different times and among diverse nations. The general prevalence of righthandedness among savage nations is still a mere assumption. Its manifestations, apart from combined operations, in the rude arts of savage life, are obscure, and not likely to attract attention, unless sought for. But in their languages terms are to be met with, showing at an early stage the preferential use of one hand. Even in the rudest state of society, man as a tool-using animal has this habit engendered in him; and as he progresses in civilization, and improves on his first rude weapons and implements, there must arise an inevitable tendency to give the preference to one hand over the other, not only in combined action, but from the necessity of adapting certain tools to the hand. The Maories of New Zealand manifest a general righthandedness in the use of the musket, even in their wild war dances. Whether this should be regarded as an acquired European practice—no more, in fact, than a modified "Manual Exercise," with what is practically a right-handed instrument,—or as the adaptation of native habits to a novel weapon, might seem of difficult solution; but it will be seen that the native language retains the evidence of right-handedness wholly independent of European influence.

The musket is fitted for a habitually right-handed people. So, in like manner, the adze, the plane, the gimlet, the screw, and other mechanical tools, must be adapted to one or the other hand. Scissors, snuffers, shears, and other implements specially requiring the action of the thumb and fingers, are all made for the right hand. A clasp-knife

is constructed with a view to the same. Not only the lock of the gun, or rifle, but the bayonet and the cartridge-pouch, are made or fitted on the assumption of the right hand being used; and even the arrangements of the fastenings of the dress are adapted to this habitual preference of the one hand over the other; so that the reversing of button and button-hole, or hook and eye, is attended with marked inconvenience. Yet even in this, much of which is due to habit is ascribed to nature. A Canadian friend, familiar in his own earlier years, at an English public school and university, with the game of cricket, tells me that when it was introduced for the first time into Canada, within the last twenty years, left-handed batters were common in every field; but the immigration of English cricketers has since introduced, for the most part, the prevailing usage of the mother country. It was not that the batters were, as a rule, left-handed; but that the habit of using the bat on one side or other was in the majority of cases so little influenced by any predisposing bias, that it was readily acquired in either way.

It is obvious that education has much to do with a full-developed right-handedness. But a very slight bias, traceable to organic structure, may have sufficed to prompt the preference at first, and so to originate the law of dexterity. The bilateral symmetry of our structure, so general in animal life, seems at first sight opposed to any inequality of action in symmetrical organs. But anatomical research reveals at a glance the deviation of internal organic structure from such seemingly balanced symmetry. Moreover, right or left-handedness is not limited to the hand, but equally affects the lower limb; as may be seen in foot-ball, skating, in the training of the opera-dancer, &c.; and eminent anatomists and physiologists have affirmed the existence of a greater development throughout the whole right side of the body. Sir Charles Bell says: "The left side is not only the weaker, in regard to muscular strength, but also in its vital or constitutional properties. The development of the organs of action and motion is greatest upon the right side, as may at any time be ascertained by measurement, or the testimony of the tailor or shoemaker." He adds, indeed, "certainly, this superiority may be said to result from the more frequent exertion of the right hand; but the peculiarity extends to the constitution also, and disease attacks the left extremities more frequently than the right."

With lefthandedness all this is reversed; and it has accordingly been regarded as the result of abnormal development. One supposition is that it depends on the relative position of the viscera, and the conse-

quent increase of circulation on one side more than the other; so that any transposition tending to reverse this action will naturally lead to greater vitality and muscular development on the opposite side. Another theory traces to the reverse development of the great arteries of the upper limbs, a greater flow of blood to the left side; while a third ascribes it directly to the supply of nervous force dependent on the early development of the brain on one side or the other.

So far as this line of argument prevails, it inevitably leads to the result that the preference of the right hand is no mere perpetuation of convenient usage, matured into an acquired, or possibly a hereditary habit; but that it is, from the first, traceable to innate physical causes. This, as Sir Charles Bell conceives, receives confirmation from the fact already referred to, that right or left-handedness is not restricted to the hand, but affects the corresponding lower limb, and, as he believes, the whole side. "No boy," he observes, "hops upon his left foot, unless he be left-handed. The horseman puts the left foot in the stirrup and springs from the right. We think we may conclude, that everything being adapted, in the conveniences of life, to the right hand, as for example the direction of the worm of the screw, or of the cutting end of the augur, is not arbitrary, but is related to a natural endowment of the body. He who is left-handed is most sensible to the advantages of this adaptation, from the opening of the parlour door to the opening of a pen-knife." And so Sir Charles Bell concludes: "On the whole, the preference of the right hand is not the effect of habit, but is a natural provision, and is bestowed for a very obvious purpose." Here right-handedness is spoken of as "a natural endowment of the body," and the whole argument is based on this assumption. But much of it would be equally explicable as the result of adaptations following on an acquired habit. Its full force will come under review at a later stage. Meanwhile it is desirable to review the various and conflicting opinions advanced by other inquirers.

The theory of Dr. Barclay, the celebrated anatomist, is thus set forth by Dr. Buchanan, from notes taken by him when a student: "The veins of the left side of the trunk, and of the left inferior extremity, cross the aorta to arrive at the vena cava; and some obstruction to the flow of blood must be produced by the pulsation of that artery." To this Dr. Barclay traced indirectly the preferential use of the right side of the body, and especially of the right hand and foot. "All motions," he stated, "produce obstruction of the circulation; and obstruction

from this cause must be more frequently produced in the right side than the left, owing to its being more frequently used. But the venous circulation on the left side is retarded by the pulsation of the aorta, and therefore the more frequent motions of the right side were intended to render the circulation of the two sides uniform." The idea, if correctly reported, is a curious one, as it traces righthandedness to the excess of a compensating force for an assumed inferior circulation pertaining naturally to the right side.

Professor Hyrtl, of Vienna, another celebrated anatomist, discusses the subject in his *Handbuck der Topographischen Anatomie* (1860), and affirms a correspondence between the ratio of left-handed persons and the occurrence of certain deviations from the normal arrangements of the blood-vessels. "It happens," he says, "in the proportion of about two in a hundred cases, that the left subclavian artery has its origin *before* the right, and in these cases lefthandedness exists, as it also often actually does in the case of complete transposition of the internal organs; and it is found that the proportion of left-handed to right-handed persons is also about two to one hundred." Prof. Hyrtl thinks that ordinarily the blood is sent into the right subclavian under a greater pressure than into the left, on account of the relative position of these vessels, that in consequence of the greater supply of blood, the muscles are better nourished and stronger, and that therefore the right extremity is more used. In cases of anomalous origin of the left subclavian, &c., the reverse occurs, and therefore the left hand is employed in preference." The theory of Professor Hyrtl has this feature to recommend it, that it equally accounts for the prevalent righthandedness, and the exceptional lefthandedness; nor can any solution of the inquiry, founded on organic structure, prove satisfactory which fails to do so. But the statistics of such internal organic structure, and its corelation with a corresponding abnormal action, are nearly inaccessible. With rare exceptions, it lies wholly beyond observation in the living subject; and any relation between it and the vital actions of individuals thus affected, are unknown. So far, however, as ascertained facts can be appealed to, they fail to sustain the above theory.

The late eminent anatomist, Professor Gratiolet, sought for a solution of the difficulty in another direction. He maintained that in the early stages of fœtal development, the anterior and middle lobes of the brain on the left side were in a more advanced condition than those on the right side, the balance being maintained by an opposite condition of

the posterior lobes. Hence, in consequence of the well-known decussation of the nerve-roots, the right side of the body—so far as it is influenced by brain-force,—would, in early fœtal life, be better supplied with nervous force than the left side; and thereby movements of the right arm would precede and be more perfect than those of the left. But the premises of Gratiolet are disputed; and even if proved, they must raise further questions, not merely as to the origin, but also as to the influence of such an unequal development of the brain on the action of the limbs.

Professor Buchanan, of Glasgow, resorts to a different theory to account for righthandedness.* According to him, "The preferential use of the right hand is not a congenital, but an acquired attribute of man. It does not exist in the earliest periods of life." Nevertheless, "no training could ever render the left hand of ordinary men equal in strength to the right;" for "it depends upon mechanical laws arising out of the structure of the human body." This theory is thus explained: In infancy and early childhood, there is no difference in power between the two sides of the body; but so soon as the child becomes capable of bringing the whole muscular force of the body into play, "he becomes conscious of the superior power of his right side—a power not primarily due to any superior force or development of the muscles of that side, but to a purely mechanical cause. He cannot put forth the full strength of his body without first making a deep inspiration; and by making a deep inspiration, and maintaining afterwards the chest in an expanded state, which is essential to the continuance of his muscular effort, he so alters the mechanical relations of the two sides of his body, that the muscles of his right side act with a superior efficacy; and, to render the inequality still greater, the muscles of the left side act with a mechanical disadvantage." Hence the preference for the right side whenever unusual muscular power is required, and with the greater exercise of the muscles of the right side, their consequent development, until the full predominance of the right side is the result.

This theory is based, not merely on the disposition of the lungs on the right side, but on these further facts: that the right lung is more capacious than the left, having three lobes, while the left has only two; that the liver, the heaviest organ of the body, is on the same side;

* Mechanical Theory of the Predominance of the Right Hand over the Left; or, more generally, of the Limbs of the Right Side over those of the Left Side of the Body. By Andrew Buchanan, M.D., Professor of Physiology in the University of Glasgow.

and that the common centre of gravity of the body shifts more or less towards the right, according to the greater or less inspiration of the lungs, and the consequent inclination of the liver resulting from the greater expansion of the right side of the chest. Herein may possibly lie a slight predisposing cause leading to a preferential use of the right side. But the evidence adduced altogether fails to account for what, on such a theory, become abnormal deviations from the natural action of the body. The position of the liver, and the influence of a full inspiration, combine, according to Dr. Buchanan, to bring the centre of gravity of the body nearly over the right foot. Hence in actively overcoming a resistance from above, as when the carter bears up the shaft of his cart on his shoulder, the muscular action originates mainly with the lower limb of the same side, which partakes of the same muscular power and development as the corresponding upper limb. On all such occasions, where the muscular action is brought directly into play in overcoming the weight or resistance, Dr. Buchanan affirms that the right shoulder is much more powerful than the left; but in the passive bearing of weights it is otherwise. The very fact that the centre of gravity lies on the right side, gives a mechanical advantage in the use of the left side in sustaining and carrying burdens; and this assigned pre-eminence of the left side and shoulder, as the bearer of burdens, is accordingly illustrated by the Professor by means of an engraving, representing "a burden borne on the left shoulder as the summit of the mechanical axis passing along the right lower limb."

Recent opportunities have afforded me a very practical means of testing this question. While travelling in one of the large steamboats on the Mississippi river, my attention was attracted by the deck-porters, who at every landing are employed in transporting the freight to and from the levee, and in supplying the vessel with cord-wood and coal. They constitute, as a class, the rudest representatives of unskilled labour, including both whites and negroes. For hours together they are to be seen going at a run to and from the lower deck of the vessel, carrying sacks of grain, bales, chests, or bundles of cord-wood. Watching them closely, I observed that some gave the preference to the right and some to the left shoulder in bearing their burden; and this whether, as with the bale and sack, they had it placed on the shoulder by others, or with the cord-wood, which they loaded for themselves. Noting, accordingly, in separate columns, the use of the right and left shoulder, and in the case of loading with cord-wood the employment of the right

and left hand, I found the difference did not amount to two to one. In one case I noted 137 carry the burden on the left shoulder to 81 on the right; in another case 76 to 45; and in the case of loading cord-wood, where the natural action of the right hand is to place the burden on the left shoulder, and where, therefore, the use of the right shoulder implies that of the left hand, the numbers were 65 using the left shoulder and 36 the right. Here, therefore, a practical test of a very simple yet reliable kind, fails to confirm the idea of any such mechanical cause inherent in the constitution of the human frame, tending to a uniform exertion of the right side and the passive employment of the left, in all muscular action.

But the unsatisfactory nature of this theory as a solution of right-handedness is placed beyond doubt, when it is applied to cases of deviation from the normal action which is assumed to result from it, and to render right-handedness a mechanical necessity. Many instances of left-handedness Dr. Buchanan considers to be probably "merely cases of ambidextrousness, when the habit of using the left side, in whatever way begun, has given to the muscles of that side such a degree of development as enables them to compete with the muscles of the right side, in spite of the mechanical disadvantages under which they labour;" but he affirms, "there is an awkwardness in the muscular efforts of such men, which seems to indicate a struggle against nature." But for those indisputable cases of "men who unquestionably use their left limbs with all the facility and efficiency with which other men use their right," he is compelled either to resort to the gratuitous assumption of "malformations and pathological lesions in early life, diseases of the right lung, contraction of the chest from pleurisy, enlargement of the spleen, distortions of the spine," &c.; or a complete reversal of the whole internal organic structure. There are men, he says, enjoying perfect health, "in whom the position of all the thoracic and abdominal viscera is reversed: there are three lobes of the left lung, and only two of the right; the liver is on the left side, and the heart on the right." But where such is the case, though it may escape observation, it is readily ascertainable during life. Any one can tell on which side his heart lies. I have long been accustomed to take note of left-handedness, and have never known a case where it could be accounted for in this way; while cases of ascertained transposition of the viscera are on record without any corresponding left-handedness. Professor Hyrtl, while referring to such abnormal organization as one of its causes, does

not venture to affirm more than that the one is often accompanied by the other. The cases hitherto observed are, in all, so very few, that without the invariable accompaniment of the left-sided lungs with left-handed action, the argument is of no value.

More recently, Dr. Humphry, of Cambridge, has discussed the cause of the preferential use of the right hand, in his monograph on "The Human Foot and the Human Hand," but with no very definite results. Many attempts, he says, have been made to answer the question, Why is man usually right-handed? "but it has never been done quite satisfactorily; and I do not think that a clear and distinct explanation of the fact can be given. There is no anatomical reason for it with which we are acquainted. The only peculiarity that we can discern, is a slight difference in the disposition, within the chest, between the blood-vessels which supply the right and left arms. This, however, is quite insufficient to account for the disparity between the two limbs. Moreover, the same disposition is observed in left-handed persons and in some of the lower animals; and in none of the latter is there that difference between the two limbs which is so general among men." Dr. Humphry accordingly inclines to the view that the superiority of the right hand is not natural, but acquired. "All men," he says, "are not right-handed; some are left-handed; some are ambidextrous; and in all persons, I believe, the left hand may be trained to as great expertness and strength as the right. It is so in those who have been deprived of their right hand in early life; and most persons can do certain things with the left hand better than with the right." So, far, therefore, Dr. Humphry's decision would appear to be wholly in favour of the conclusion that the superiority of the right hand is an acquired habit. But after stating thus much, he sums up with this very refined distinction: "Though I think the superiority of the right hand is acquired, and is a result of its more frequent use, the tendency to use it in preference to the left is so universal, that it would seem to be natural. I am driven, therefore, to the rather nice distinction, that, though the superiority is acquired, the tendency to acquire the superiority is natural."

This amounts to something very like an evasion of the real difficulty, unless we assume Dr. Humphrey to mean only what Dr. Buchanan states, that during the weakness of infancy and childhood the two hands are used indiscriminately; and the preferential use of one side rather than the other does not manifest itself until the muscular system has acquired active development. All the processes by which dexterity in

manipulation and the use of tools is manifested, are acquired. Men are not born with carpentering, weaving, modelling and architectural instincts, requiring no apprenticeship or culture, like ants, bees and spiders, martins and beavers: though the aptitude in mastering such arts is greater in some than in others. But if the tendency in their practice to use the right hand is natural, that is to say innate or congenital, then there need be no nice distinctions in affirming it.

But on any clearly defined physiological deductions of right-handedness from the disposition of the organs of motion, or circulation, or any other uniform relation of the internal organs, and the great arteries of the upper limbs, left-handedness becomes mysterious, if not inexplicable, unless on the assumption of a corresponding reversal of organic structure; for Dr. Humphry's assertion that "in all persons the left hand may be trained to as great expertness and strength as the right," is contradicted by the experience of left-handed persons in their efforts to apply the same training to the right hand.

Examples of the assumed organic causes of left-handedness, as already stated, have been repeatedly observed, with no such accompanying results. One case of the transposition of the viscera, in which, nevertheless, the person was right-handed, recorded by M. Géry, is quoted in Cruveillier's *Anatomie*, i. p. 65. Another is given by M. Gachet, in the *Gazette des Hopitaux*, Aug. 31, 1861; and a third in the Pathological Transactions, vol. xix. p. 447 (*Nature*, Apr. 28, 1870). In like manner the theory of Professor Hyrtl fails on appeal to facts. A correspondent of *Nature* (P. S. June 9, 1870) refers to a case of transposition of the origin of the right subclavian artery—disclosed by the occurrence of aneurism,—where the person was ascertained to have been undoubtedly right-handed. So far, therefore, physiological evidence fails to account satisfactorily for right or left-handedness.

Turning to other sources of information relative to this supposed uniformity of general action, the evidence is of a very varied character; and many curious glimpses of the practice of ancient nations, and of savage races, are still recoverable. An interesting discovery, supposed to prove the simultaneous use, by preference, of the right and the left hand by two fellow-flintworkers of the old prehistoric dawn, is given by the Rev. William Greenwell, in a communication to the Ethnological Society of London, on the opening of some ancient flint pits, called "Grime's Graves," in Norfolk. The rude flint implements abundantly found in the course of his researches are such as are assigned to the

Neolithic age; and the bone implements which specially attract our interest now, fully accord with such a classification. In clearing out one of the subterranean galleries excavated in the chalk, it was found that "the roof had given way about the middle of the gallery, and blocked up the whole width of it. On removing this, it was seen that the flint had been worked out in three places at the end, forming three hollows, extending beyond the chalk face of the end of the gallery." In front of two of these hollows lay two picks, corresponding to others found in various parts of the shafts and galleries, made from the antler of the red deer. But in this case the writer notes that the handle of each was laid towards the mouth of the gallery, the tines, which formed the blades of the tools, pointing towards each other, "showing, in all probability, that they had been used respectively by a right and a left-handed man. The day's work over, the men had laid down each his tool, ready for the next day's work; meanwhile the roof had fallen in, and the picks had never been recovered."

The picks thus made from the antlers of the red deer were constructed simply by detaching the horn at a distance of about sixteen or seventeen inches from the brow end, and then breaking off all but the large brow-tine, with the help of fire and rude cutting implements of flint. They had been used both as picks and hammers, the point of the brow-tine serving for a pick, and the broad flat part opposite to it as a hammer, for breaking off and detaching the flint from the chalk; while excavations through the solid chalk were effected by means of hatchets of basalt. The marks of both tools were abundant on the walls of the galleries; and many of the rude picks, including the two specially referred to, were coated with an incrustation of chalk, bearing the impress of the workmen's fingers. Unfortunately this evidence, although so distinct as to show the print of the skin most apparent, does not appear to have been appealed to as the conclusive test of the right and left-handed workmen, by whom they were employed at the close of that last day's labour, in the prehistoric dawn. Here, however, the evidence, so far as it goes, leaves the right and left-handed workmen of that remote era with no determinate preference either way.

But one test of a very reliable kind proves the recognition of right-handedness among races in as primitive a condition as the rudest of the flint folk of Europe's dawn. Even among the degraded Australians, and the Pacific Islanders, terms for right, the right-hand, or approximate expressions, show a familiarity with the distinction.

In the Kamilarai dialect of the Australians bordering on Hunter's River and Lake Maquarie, *matara* signifies hand, but they have the terms *turovn*, right, on the right hand, and *ngorangón*, on the left hand. In the Wiraturăi dialect of the Wellington Valley, the same ideas are expressed by the words *bumalgál* and *miraga*, *i. e.*, dextrorsum and sinistrorsum.

The idea which lies at the root of our own decimal notation, and has long since been noted by Lepsius, Donaldson and other philologists, as the source of names of Greek and Latin numerals, is no less discernible in the rudest savage tongues. Among the South Australians the simple names for numerals are limited to two, viz., *ryup*, one, and *politi*, two; the two together express three; *politi-politi*, four; and then five is indicated by the term *ryup-murnangin*, *i. e.*, one hand; ten by *politi-murnangin*, *i. e.*, two hands. The same idea is apparent in the use (in the dialects of Hawaii, Raratonga, Viti, and New Zealand) of the common terms *lima*, *rima*, *linga*, *ringa*, &c., for *hand* and the number *five*. But *fulu*, and its equivalents, stand for *ten*, apparently from the root *fu*, whole, altogether; while the word *tau*, which in the Hawaian signifies *ready*, in the Tahitian *right*, *proper*, and in the New Zealand *expert*, *dextrous*, is the common Polynesian term for the right-hand. In the Vitian language, as spoken in various dialects throughout the Viti or Fidji Islands, the distinction is still more explicitly indicated. There is first the common term *linga*, the hand, or arm; then the ceremonial term *daka*, employed exclusively in speaking of that of a chief, but which, it may be presumed, also expresses the right-hand: as, while there is no other word for it, a distinct term *sema* is the left-hand. The root *se* is found not only in the Viti, but also in the Samoa, Tonga, Mangariva, and New Zealand dialects, signifying to err, to mistake, to wander; *semo*, unstable, unfixed. But also there is the word *matau*, right, dexter, clearly proving the recognition of the distinction. Again, in the Terawan language, spoken throughout the group of islands on the equator, called the Kingsmill Archipelago, the terms *atai* or *edai*, right, dexter, (entirely distinct from *rapa*, good, right,) and *maan*, left, sinister, are applied to *bai*, or *pai*, the hand, to denote the difference, *e. g.*, *Te bai maan*, the left hand, *i. e.*, the dirty hand, that which is not used in eating.

Turning to the languages of the American continent, similar evidence reveals the recognition among its savage hunter-tribes of the distinction between the right and left hand. In the Chippeway the word for my

right hand is *ne-ke-che-neenj*, *ne* being the prenominal prefix, literally my great hand. My left hand is *ne-nuh-munje-neenj-ne*. *Nu-munj* is the same root as appears in *nuh-munj-e-doon*, I do not know; and the idea obviously is the uncertain, or unreliable hand. Again, in the Mohawk language, the right hand is expressed by the term *ji-ke-we-yen-den-dah-kon*, from *ke-we-yen-deh*, literally, "I know how." *Ji* is a particle conveying the idea of *side*, and the termination *dah-kon* has the meaning of "being accustomed to." It is, therefore, the limb accustomed to act promptly, the dextrous organ. *Ske-ne-kwa-dih* the left hand, literally means "the other side."

The American languages abound with examples of a decimal system of numerals traceable to the primitive mode of counting on the fingers. On the Labrador coast, *tallek*, a hand, also signifies five. Among the Muyska Indians the phrase for five is "hand finished." Ten is "two hands finished." The feet are then resorted to in similar fashion so as to express the numerals to twenty. This process was in use among the Caribs, and is common to widely severed races of the old and new world, with special modifications expressing the same recognition of the inferior rank of one hand in relation to the other, which is indicated in the classical *sinistra* as compared with the *dextera manus*.

The Anglo-Saxon equivalent terms are *swythre* and *wynstre*, as in Matthew vi. 3: "Sothlice thonne thu thinne aelmessan do, nyte thin wynstre hwaet do thin swythre;" "When thou doest alms, let not thy left hand know what thy right hand doeth." Again the distinction appears in a subsequent passage thus: "And he geset tha scep on hys swithran healfe, and tha tyccenu on hys wynstran healfe." (Matt. xxv. 34.) Here the derivation of *swythre* from *swyth*, strong, powerful, *swythra*, a strong one, a dextrous man, *swythre*, the stronger, the right hand, is obvious enough. It is also used as an adjective, as in Matthew v. 30: "And gif thin *swythre hand* the aswice, aceorf hig of;" "And if thy right hand offend thee, cut it off." The derivation of *wynstre* is less apparent, and can only be referred to its direct significance, *se wynstra*, the left. In the isolated *ἀριστερός*, *ἀριστερά*, there is a comparative form, arising, it may be, from the depreciatory comparison between it and its more favoured brother, the *δεξιά*, or right-hand. This is obvious enough in the *σκαιός*, the left, the ill-omened, the unlucky; or, like the French *gauche*, awkward, clumsy, uncouth. The left arm was the shield-bearer; hence *ἐπ' ἀσπίδα*, on the left, &c.

In Scotland the older Gaelic has supplied the term ker or carry-handed, from *lamh-chearr*, the left hand. There is no separate word in the Gaelic for right hand, but it is called *lamh dheas* and *lamh cheart*. Both words imply *proper*, *becoming*, or right, *dheas*, δεξιός; *chearr*, χάρτα, *certus*. *Ceart* is the common term to express what is right, correct, or fitting, whereas *dheas* primarily signifies the *south*, and is explained by the supposed practice of the Druid augur following the sun in his divinations. In this it will be seen to agree with the secondary meaning of the Hebrew *Yamin*, and to present a common analogy with those of corresponding Greek and Latin terms hereafter referred to. *Deisal*, a compound of *dheas*, south, and *iùl*, a guide, a course, is commonly used as an adjective, to express a lucky or favourable occurrence. The left hand is variously styled *lamh chli*, the wily or cunning hand, and *lamh chearr*, or *chiotach*. *Cearr* is wrong, unlucky, and *chiotach* is the equivalent of *sinister*, formed from the specific name for the left-hand, *ciotag*, Welsh *chwithig*. There is no corresponding equivalent to express the right hand. According to Pliny (*Hist. Nat.* lib. xxviii. c. 2), "The Gauls, in their religious rites, contrary to the practice of the Romans, turned to the left," though the precise directions most favoured in Roman augury are subject to variable interpretation.

Adopting the Gaelic *cearr*, the lowland Scots use the term ker, or carry, for left-handed. In the secondary meanings attached to it, it signifies awkward, devious, and in a moral sense is applied in the same way as *sinister* in English. To "*gang the car gate*" is to go the left road, *i. e.*, the road to ruin. An ancient tradition, referred to by the elder Scottish historians, traces the surname of Kerr to the fact that the Dalriadic king, Kynach-Ker or Connchad Cearr, as he is called in the Duan Albanach, was left-handed. In some parts of Scotland, and especially in Lanarkshire, it is an evil omen to meet a carry-handed person when setting out on a journey. Jamieson notes the interjectional phrase *car-shamye*, (Gaelic *sgeamh-aim*, to reproach,) as in use in Kinross-shire, in the favourite Scottish game of shintie, when an antagonist takes what is regarded as an undue advantage by using his club, or shintie, in the left hand. All this, while it indicates the exceptional character of left-handedness, clearly points to a habit of such frequent occurrence as to be familiarly present to every mind.

The idea of weakness, uncertainty, unreliability, attaching to the left hand, naturally leads to the tropical significance of unreliable,

untrustworthy, in a moral sense; and both ideas are found alike in barbarous and classical languages. An interesting example of the former occurs in Ovid's Fasti, iii. 869, where the poet speaks of the flight of Helle and her brother on the golden-fleeced ram, and describes her as grasping its horn "with her feeble left hand, when she made of herself a name for the waters," *i. e.*, by falling off and being drowned:

> "Utque fugam capiant aries nitidissimas auro
> Traditur; ille vehit per freta longa duos;
> Dicitur informa cornu tenuisse sinistra
> Femina cum de se nomina fecit aquæ."

In the depreciatory moral sense, Plautus, in the "Persa," ii. 2, 44, calls the left hand *furtifica*, thievish. "Estne hæc manus? Ubi illa altera est furtifica læva?" So in like manner the term in all its forms acquires a depreciatory significance, and is even applied to sinister looks.

Another line of investigation tends to confirm the idea of man having a preferential and more skilful hand at the earliest stage of his mastery of tools and implements of war or husbandry. The prevalence of a decimal system of numerals among widely severed nations, alike in ancient and modern times, has been universally ascribed to the simple process of counting with the aid of the fingers. Mr. Francis Galton, in his *Narrative of an Exploration in Tropical Africa*, when describing the efforts of the Damaras at computation, states that the mental effort fails them beyond *three*. "When they wish to express *four*, they take to their fingers, which are to them as formidable instruments of calculation as a sliding-rule is to an English school-boy. They puzzle very much after *five*, because no spare hand remains to grasp and secure the fingers that are required for units." Turning to the line of evidence which this primitive method of computation suggests, some striking analogies reveal a recognition of ideas common to the savage of the Polynesian archipelago and to the cultivated Greek and Roman. Donaldson, in *The New Cratylus*, in seeking to trace the first ten numerals to their primitive roots in Sanscrit, Zend, Greek and Latin, derives seven of them from the three primitive prenominal elements. But *five*, *nine* and *ten* are referred directly to the same infantile source of decimal notation, suggested by the ten fingers, as that which has been recognised in similar operation among the Hawaians and New Zealanders. "One would fancy, indeed, without any particular investigation of the subject, that the number five would have some connec-

tion with the word signifying a hand, and the number ten with a word denoting the right hand; for in counting with our fingers we begin with the little finger of the left hand, and so on till we get to the little finger of the right hand." Hence the familiar idea, as expressed in its simplest form, where Hesiod (Op. 740) calls the hand *πέντοζον*, the five-branch; and hence also *πεμπάζω*, primarily to count on five fingers.

Bopp, adopting the same idea, considers the Sanscrit *pan'-cha* as formed of the copulative conjunction added to the neuter form of *pa*, one, and so signifying "and one." Benary explains it as an abbreviation of *pân'i-cha*, "and the hand;" the conjunction being equally recognisable in *pan'-cha*, *quin-que*, and *πέν-τε*. This, they assume, expressed the idea that the enumerator then began to count with the other hand; but Donaldson ingeniously suggests the simpler meaning, that after counting four, the whole hand was opened and held up. To reckon by the hand was, accordingly, to make a rough computation, as in the "Wasps" of Aristophanes, where Bdelycleon bids his father, the Dicast, "first of all calculate roughly, not by pebbles, but, *ἀπὸ χειρός*, with the hand."

The relation of *δεξιά* to *δέκα* and *dextra*, *δέκ-α decem*, *δεκ-σιός*, *decster*, all illustrate the same idea. Grimm, indeed, says, "In counting with the fingers, one naturally begins with the left hand, and so goes on to the right. This may explain why, in different languages, the words for *the left* refer to the root of *five*, those for *the right* to the root of *ten*." Hence also the derivation of *finger*, through the Gothic, and Old High German, from the stem for *five* and *left;* while the Greek and Latin *δάκτυλος* and *digitus*, are directly traceable to *δέκα* and *decem*. The connexion between *ἀριστερά* and *sinistra* is also traced with little difficulty, the sibilant of the latter being ascribed to an initial digamma, assumed in the archaic form of the parent vocabulary. Nor is the relationship of *δεξιά* with *digitus* a far-fetched one. As the antique custom was to hand the wine from right to left, so it may be presumed that the ancients commenced counting with the left hand, in the use of that primitive abacus, finishing with the dexter or right hand at the tenth digit, and so completing the decimal numeration.

The inferior relation of the left to the right hand was also indicated in the use of the former for lower, and the latter for higher numbers beyond ten. In reckoning with their fingers, both Greeks and Romans counted on the left hand as far as a hundred, then on the right hand to two hundred, and so on alternately, the even numbers being always

reckoned on the right hand. The poet, Juvenal, refers to this in his tenth Satire, where, in dwelling on the attributes of age, he speaks of the centenarian, "who counts his years on his right hand."

> "Felix nimirum, qui tot per sæcula mortem
> Distulit, atque suos jam dextra computat annos,
> Quique novum toties mustum bibit."

A curious allusion, by Tacitus, in the first book of his History, serves to show that the German barbarians beyond the Alps no less clearly recognized the significance of the right hand, as that which was preferred, and accepted as the more honourable member. The Lingones, a Belgian tribe, had sent presents to the Legions, as he narrates, and in accordance with ancient usage, gave as the symbolical emblem of friendship, two right hands clasped together. "Miserat civitas Lingonum vetere instituto dona legionibus, dextras, hospiti insigne." The dextræ are represented on a silver quinarius of Julius Cæsar, described in Ackerman's "Catalogue of rare and unedited Roman Coins," vol. i. p. 106.

Other evidence of a different kind confirms the recognition and preferential use of the right hand among our Germanic ancestors from the remotest period. Dr. Richard Lepsius, in following out an ingenious analysis of the primitive names for the numerals, and the sources of their origin, traces from the common Sanskrit root *daça*, Greek *δέza*, through the Gothic *taihun*, the *hunda*, as in *tva hunda*: two hundred. He next points out the resemblance between the Gothic *hunda* and *handus*, i.e., the hand, showing that this is no accidental agreement, but that the words are etymologically one and the same. The A. S. *hund*, a hundred, originally meant only ten, and was prefixed to numerals above twenty, as *hund eahtatig*, eighty, &c.

The whole argument, thus glanced at, proceeds on the assumption that right-handedness is natural, and of universal recognition. When we turn from purely philological to direct historical evidence, the proofs of its recognition are sufficiently distinct to leave no doubt on the mind. Oldest and clearest of all are the references in early Hebrew history. We learn from the Book of Judges (c. xx. v. 16), that in the tribe of Benjamin, out of twenty-six thousand men that drew the sword, there were "seven hundred chosen men, left-handed: every one could sling stones at a hair's breadth, and not miss." The skill thus ascribed to the left-handed Benjamites will properly come under review on a

later page, in considering how far this peculiarity is really abnormal. But other references suffice to show how thoroughly the distinction of right and left-handedness was recognized among the ancient Hebrews. Ehud, the deliverer of Israel from their servitude to Eglon, king of Moab, is noted as "a Benjamite, a man left-handed;" and in the act by which he delivered them from their oppressor, it is stated that he "put forth his left hand, and took the dagger from his right thigh," (Judges, c. iii. v. 21). Again it is recorded (1 Chron. xii. v. 2), when David was in hiding at Ziklag, there came to him a company of mighty men, "who were armed with bows, and could use both the right hand and the left in hurling stones and shooting arrows out of a bow." These latter, it will be observed, are not left-handed, but ambidextrous. Even among those who, by reason of a natural left-handedness, have ultimately acquired unwonted facility with both hands, it is rare indeed to find one who can use both the right and the left hand to throw a stone with equal force and precision.

But this leads to another inquiry, of no slight importance in reference to the whole bearing of the question. The application of the Latin *dexter* to right-handedness specifically, as well as to general dexterity in its more comprehensive significance, points, like the record of the old Benjamites, to the habitual use of one hand in preference to the other; but does it necessarily imply that *their* "right hand" was the one on that side which we now concur in calling dexter or right? In the exigencies of war or the chase, and still more in many of the daily requirements of civilized life, it is necessary that there should be no hesitation as to which hand shall be used. Promptness and dexterity depend on this, and no hesitation is felt. But, still further, in many cases of combined action, it is needful that the hand so used shall be the same; and wherever such a conformity of practice is recognized—as among the seven hundred slingers of the tribe of Benjamin,—the hand so used, whichever it be, is that on which their *dexterity* depends, and becomes practically the *right* hand. Curiously, indeed, the term *yamin* (the right hand) is the root of the proper name, Benjamin, *i.e.*, *son of the right hand.* It is derived from the verb *yāmăn*, to be firm, to be faithful, as the right hand is given as a pledge of fidelity, *e.g.*, "The Lord hath sworn by his right hand" (Isaiah, lxii. 8). So in the Arabic form, *Bimin Allah*, by the right hand of Allah. Or again, as symbolical of treachery, "Their right hand is a right hand of falsehood," (Psalm cxliv. 8).

So also with the Hebrews and other ancient nations, as still among ourselves, the seat at the right hand of the host, or of any dignitary, was the place of honour: as when Solomon "caused a seat to be set for the king's mother, and she sat on his right hand" (1 Kings, ii. 19). Again: the term is frequently used in opposition to *semal*, left hand; as when the children of Israel would pass through Edom; "We will go by the king's highway; we will not turn to the right hand or to the left" (Numbers, xx. 17).

But a further use and significance of the terms helps us to the fact that the Hebrew *yamin* and our *right hand* are the same. In its secondary meaning it signified *the south*, as in Ezekiel, xlvii. 1: "The fore front of the house stood toward the east, and the waters came down from under, from the right side of the house, at the south side of the altar." The four points are accordingly expressed thus in Hebrew: *yamin*, the right, the south; *kedem*, the front, the east; *semol*, the left, the north; *achor*, behind, the west. To the old Hebrew, when looking to the east, the west was thus behind, the south on his right hand, and the north on his left. A different idea is illustrated by the like secondary significance of the Greek σκαιός, left, or on the left hand; but also used as *west*, or *westward*, as in the Iliad, 3, 149, σκαιαὶ πύλαι, the west gate of Troy. The Greek augur, turning as he did his face to the northward, had the left—the sinister, ill-omened, unlucky side,—on the west. Hence the metaphorical significance of ἀριστερός, ominous, boding ill. With the Roman augur, the particular quarter of the heavens towards which he was to look appears to have been variable. Livy says the east, Varro the south, and Frontinus the west. Probably part of the augur's professional skill consisted in selecting the aspect of the heavens suited to the occasion. But this done, the flight of birds and other appearances on the right or on the left, determined the will of the gods. "Why," asks Cicero, himself an augur, "Why should the raven on the right, and the crow on the left, make a confirmatory augury?" "Cur a dextra corvus, a sinistra cornix faciat ratum?" (*De Divin.* I.) The left was the side on which the thunder was declared to be heard which confirmed the inauguration of a magistrate, and in other respects the augur regarded it with special awe. But still the right side was, in all ordinary acceptance, the propitious one; as in the address to Hercules (Æn. viii. 302):

> "Salve vera Jovis proles, pecus addite divis;
> Et nos et tua dexter adi pede sacra secundo."

The rites of the social board among the ancient Greeks required the passing of the wine from right to left—or, at any rate, in one invariable direction,—as indicated by Homer in his description of the feast of the gods, (Iliad, i. 597, *θεοῖς ἐνδέξια πᾶσιν ᾠνοχόει,*) where Hephæstus goes round and pours out the sweet nectar to the assembled gods. The direction pursued by the cup-bearer would be determined by his bearing the flagon in his right hand, and so walking from left to right, with his right hand towards the guests. This is, indeed, a point of dispute among scholars. But it is sufficient for our present purpose that a uniform practice prevailed, dependent on the recognition of right and left-handedness; and this is no less apparent among the Romans than the Greeks. It is set forth in the most unmusical of Horace's hexameters: "Ille sinistrorsum, hic dextrorsum abit;" and finds its precise elucidation from many independent sources: in the allusions of the poets, in the works of the sculptors, and the decorations of fictile ware. The determination of the actual right and left of the Greeks and Romans, as of other nations, in order to ascertain if they were the same as our own, is important in relation to the whole bearing of this inquiry. But the true direction of the Hebrew right and left has a special significance, in view of the fact that whilst the great class of Aryan languages, including the ancient Sanscrit, Greek and Latin, appear to have been written from left to right, and the same characteristic is common to the whole alphabets and writings of India, all the Semitic languages, except the Ethiopic, are written from right to left. This uniform habit has so largely affected our current handwriting, and modified its forms into those best adapted for rapid and continuous execution in the one direction, that its reversal at once suggests the idea of its origination among a left-handed people. But there is no true ground for this. So long as each character was separately drawn, and when, moreover, they were pictorial or ideographic, it was, in reality, more natural to begin at the right, or nearer side, of the papyrus or tablet, than to pass over to the left. The direction of the writing only becomes significant in reference to a current hand. The older Greek fashion of boustrophedon, or alternating, like the course of oxen in ploughing, still more strongly illustrates the natural process of beginning uniformly at the side nearest to the hand; nor did either this, or the still earlier mode of writing in columns, as with the ancient Egyptians, or the Chinese, present any impediment, so long as it was executed in detached characters.

The materials in use by the scribe necessarily affect the forms in use. So soon as the reed or quill, with the coloured liquid or pigment, took the place of the chisel, or style, and the papyrus was substituted for the stone tablet or metal plate, a complete revolution followed in the form of phonetic or alphabetic signs. The process may be seen in the modern student's first efforts at writing Greek, with the gradual adoption of tied letters, and the requisite modifications of intractable characters, such as the *lambda* and *chi*, which do not readily conform to the slope or fashion of modern epistolography. So soon as the Egyptians adopted the reed and papyrus, the hieratic writing began to be modified in this fashion; and when it passed into the demotic handwriting, the same influences were at work which control the modern penman in the slope, direction and force of his stroke, with one important exception. To the last their enchorial or demotic writing was mainly executed in detached characters, and does not, therefore, constitute a true current hand-writing, such as in our own continuous penmanship leaves no room for doubt as to the hand by which it was executed. Any sufficiently ambidextrous penman, by applying the practical test of attempting to copy a piece of modern current writing with either hand, would determine beyond all question its right-handed execution. But no such certain result is found on applying the same test to the Egyptian demotic. I have ascertained by experiment on two of the Louvre demotic MSS. and a portion of a Turin papyrus, that they can be copied with nearly equal dexterity with either hand. Some of the characters are more easily and naturally executed, without lifting the pen, with the left hand than the right. Others again, in the slope and the direction of the thickening of the stroke, suggest a right-handed execution; and this is more apparent in some other examples both of hieratic and demotic writing. But habit in the forming of the characters, as in writing Greek, or Arabic, would so speedily overcome any difficulty either way, that I feel assured no habitually left-handed writer would find any difficulty in acquiring the unmodified demotic hand; whereas no English penman compelled to resort to the left hand in executing the ordinary current transcription, however great might be his acquired dexterity, could fail to indicate the change, in the slope, the stroke, and the formation of the letters.

So far as pure hieroglyphics are concerned, especially as most commonly executed in mural inscriptions, they frequently present features calculated to suggest the idea that the Egyptians were a left-handed

people; and this is even more strongly suggested by other evidence. Nevertheless the peculiarities appear to be satisfactorily accounted for on other grounds. The normal way of writing the hieroglyphics appears to have accorded with that of the Hebrew and other semitic languages, though examples do occur of true hieroglyphic papyri written from left to right. But the more direct test is dependent on the pictorial character of such writings. It is easier for a right-handed draftsman to draw a profile with the face looking towards the left, and the same influence might be anticipated to affect the direction of the characters incised on the walls of temples and palaces; so that this seems to offer an available test of Egyptian right or left-handedness. But the evidence derived from Egyptian monuments is liable to mislead. A writer in *Nature* (J. S., April 14th, 1870,) states as the result of a careful survey of the examples in the British Museum, that the hieroglyphic profiles there generally look to the right, and so suggest the work of a left-handed people. Other and more suggestive evidence from the monuments of Egypt points to the same conclusion, but it is deceptive. If, for example, the inquirer examine two columns of hieroglyphics running down the front, or cover, of the great sarcophagus of "Sarcoph of Sebaksi, priest of Phtha," in the British Museum, he will find that the profiles in each column look towards the centre line. This is a key to the direction of Egyptian profiles, both in sculpture and hieroglyphics. It appears to have been mainly determined by the relation of each to the architectural details of the façades which they so largely contributed to enrich, and hence any inference based on the direction of detached examples is apt to mislead.

In discussing the character of the Palenque hieroglyphics of Central America, at an earlier date, the bearing of this class of evidence on the question under consideration was thus set forth: "It is noticeable that in the frequent occurrence of human and animal heads among the sculptured characters, they invariably look towards the left: an indication, as it appears to me, that they are the graven inscriptions of a lettered people, who were accustomed to write the same characters from left to right on paper or skins. Indeed, the pictorial groups on the Copan statues seem to be the true hieroglyphic characters; while the Palenque inscriptions show the abbreviated hieratic writing. To the sculptor the direction of the characters was a matter of no moment; but if the scribe held his pen or style in his right hand, like the modern

clerk, he would as naturally draw the left profile as we slope our current hand to the right." * In the pictorial hieroglyphics, reproduced in Lord Kingsborough's *Mexican Antiquities*, as in other illustrations of the Arts of Mexico and Central America, it is also apparent that the battle-axe and other weapons and implements are most frequently held in the right hand. But to this exceptions occur; and it is obvious that the crude perspective of the artist influenced the disposition of the tools, or weapons, according to the action designed to be represented, and the direction in which the actor looked.

If the difficulties of foreshortening and general perspective are overlooked, and the decorative value of the hieroglyphics in Egyptian architecture is left out of account, the evidence they afford in reference to the right or left-handedness of their executors is of a conflicting nature. The conclusion drawn by one observer from a study of the extensive collection of the British Museum, as we have seen, is that the prevailing direction of the profiles is as a left-handed draughtsman would represent them. But the result of more extended observation shows that the direction of the profiles, and of hieroglyphics generally, is due to totally different causes, and depended on their relation to the general architectural design, or to the principal figures to which they refer. This is borne out by ample evidence to be found in Champollion's *Monuments de l' Egypte et de la Nubie;* and is fully confirmed by Maxime Du Camp's "Photographic Pictures of Egypt, Nubia, &c.;" by Sir J. Gardner Wilkinson's "Manners and Customs of the Ancient Egyptians;" and by other photographic and pictorial evidence. In a group, for example, photographed by Du Camp, from the exterior of the sanctuary of the Palace of Karnak, where the Pharaoh is represented crowned by the ibis and hawk-headed deities, Thoth and Horus, the hieroglyphics are cut on either side so as to look towards the central figure. The same arrangement is repeated in another group at Ipsamboul, engraved by Champollion, *Monuments de l' Egypte,* Tome prem. pl. v. Still more, where figures are intermingled, looking in opposite directions—as shown in a photograph of the elaborately sculptured posterior façade of the Great Temple of Denderah,—the accompanying hieroglyphics, graven in columns, vary in direction in accordance with that of the figure to which they refer. Columns of hieroglyphics repeatedly occur, separating the seated deity and a worshipper standing before him, and only divided by a perpendicular line, where the charac-

* Prehistoric Man, 2nd Ed. p. 380.

ters are turned in opposite directions corresponding to those of the immediately adjacent figures.

I have dwelt on this question of the direction of the hieroglyphic characters with some minuteness, because the proof of a uniform adherence to either direction would have tended strongly to sustain the idea of their being the work of a right or of a left-handed people. The whole question might indeed seem to be settled beyond dispute, by the repeated representations both of gods and men, engaged in the actual process of writing. Among the incidents introduced in the oft-repeated judgment scene of Osiris—as on the Adytum of the Temple of Dayr el Medineh, of which I have a photograph,—Thoth, the Egyptian God of Letters, stands with the stylus in his left hand, and a papyrus or tablet in his right, and records against the deceased, in the presence of the divine judge, the results of the literal weighing in the balance of the deeds done in the body.

So conclusive does this and other monumental evidence seem, in proof of the assumption that the Egyptians were a left-handed people, that, on writing to an Egyptian traveller, who has spent successive winters on the Nile, photographed its temples, and brought home paper casts of the Judgment of Osiris at Dayr el Medineh, as well as of other sculptured scenes, he referred to it as decisive. He thus writes: "I have looked over my photographs, casts, and paper impressions of subjects on the walls of temples and tombs in Egypt and Nubia, and I find in them that the left hand is always used where we use the right. On the wall of the Temple of Karnac, Thotmes III. is represented making an offering contained in a vase. His right side is towards the looker-on, but he holds the vase on the palm of the left hand, which is extended at arm's length." He then refers to the Judgment scene at Dayr el Medineh, and adds, "In other smaller representations of the same Judgment scene, Thoth is always represented holding the style in his left hand. In the sculpture on the wall of the great chamber in the rock-temple of Abou Simbel, Rameses is represented slaying his enemies with a club, which is held in his left hand. In the sculptures of Pasht, she is represented decapitating her prisoners with a scimiter, which is always held in the left hand." The evidence thus adduced seems so direct and indisputable as to settle the question; yet further research leaves on my mind no doubt that it is illusory.

When, as in the Judgment scene at El Medineh and elsewhere, Osiris is seated looking to the right, Thoth faces him holding in the

off-hand—as more extended, by reason of the simple perspective,—the papyrus or tablet; while the pen or style is held in the near or left hand; to have placed the pen and tablet in the opposite hand, would have required a complex perspective and foreshortening, or would have left the whole action obscure and unsuited for monumental effect. Nevertheless, the difficulty is overcome in repeated examples: as in a repetition of the same scene engraved in Sir J. Gardner Wilkinson's "Manners and Customs of the Ancient Egyptians" (pl. 88), and on a beautifully executed papyrus, part of "The Book of the Dead," now in the Louvre, and reproduced in facsimile in Sylvestre's *Universal Palæography* (vol. i. pl. 46), in both of which Thoth holds the pen or style in the right hand. The latter also includes a shearer holding the sickle in his right hand, and a female sower, with the seed-basket on her left arm, and scattering the seed with her right hand. Examples of scribes, stewards, and others engaged in writing, are no less common in the scenes of ordinary life; and though when looking to the left, they are, at times, represented holding the style or pen in the left hand, yet the great preponderance of evidence suffices to refer this to the exigencies of primitive perspective. The steward in a sculptured scene from a tomb at Elethya (*Monuments de l'Egypte*, pl. 142), receives and writes down a report of the cattle from the field servants, holding the style in his right hand, and the tablet in his left. So is it with the registrar and the scribes (*Wilkinson*, figs. 85, 86); the steward who takes account of the grain delivered (fig. 387), and the notary and scribes (figs. 73, 78), all from Thebes; where they superintend the weighing at the public scales, and enumerate a group of Negro slaves.

In the colossal sculptures on the façades of the great temples, where complex perspective and foreshortening would interfere with the architectural effect, the hand in which the mace or weapon is held appears to be mainly determined by the direction to which the figure looks. At Ipsamboul, as shown in *Monuments de l'Egypte*, pl. 11, Rameses grasps with his right hand, by the hair of the head, a group of captives of various races, negroes included, while he smites them with a scimiter or pole-axe, wielded in his left hand; but an onlooker, turned in the opposite direction, holds the sword in his right hand. This is still more markedly shown in two scenes from the same temple (pl. 28). In the one Rameses, looking to the right, wields the pole-axe in the near or right hand, as he smites a kneeling Asiatic; in the other, where he

looks to the left, he holds his weapon again in the near, but now the left hand, as he smites a kneeling negro. On the same temple soldiers are represented holding spears in the near hand, right or left, according to the direction they are looking (pl. 22); and swords and shields are transposed in like manner (pl. 28). The same is seen in the siege scenes and military reviews of Rameses the Great, on the walls of Thebes and elsewhere.

In the example from Karnac,—appealed to in proof that the Egyptians were a left-handed people,—where Thotmes III. holds his offering in the extended left hand, his right side is stated to be towards the observer. Nor are similar examples rare. Thoth and other deities, sculptured in colossal proportions, on the Grand Temple of Isis, at Philæ, as shown by Du Camp, in like manner have their right sides towards the observer, and hold each the mace or sceptre in the extended left hand. But on turning to the photographs of the Great Temple of Denderah, where another colossal series of deities is represented in precisely the same attitude, but looking in the opposite direction, the official symbols are reversed, and each holds the sceptre in the extended right hand. Numerous similar instances are given by Wilkinson; as in the dedication of the pylon of a temple to Amun by Rameses III. Thebes (No. 470); the Goddesses of the West and East, looking in corresponding directions (No. 461), &c.

Examples, however, occur where the conventional formulæ of Egyptian sculpture have been abandoned, and the artist has overcome the difficulties of perspective; as in a remarkable scene in the Memnonium, at Thebes, where Atmoo, Thoth, and a female (styled by Wilkinson the Goddess of Letters), are all engaged in writing on the fruit of the Persea tree the name of Rameses. Though looking in opposite directions, each holds the pen in the right hand (Wilkinson, pl. 54 A). So also at Beni Hassan, two artists kneeling in front of a board, face each other, and each paint an animal, holding the brush in the right hand. At Medinet Habou, Thebes, more than one scene of draught-players occurs, where the players, facing each other, each hold the piece in the right hand. Similar illustrations might be greatly multiplied; but while definite evidence of this kind clearly indicates right-handedness, it is obvious that the Egyptian monumental evidence, as a whole, must be employed with cautious discrimination, before its true bearing can be determined.

Among another people, of kindred artistic skill, whose monumental records have been brought anew to light in very recent years, similar

evidence appears to furnish somewhat more definite results; while proof of a wholly different kind leaves no room to doubt that among them a specific hand was recognized as that which every child learned to prefer so soon as reason assumed its sway. When the prophet had proclaimed the destruction of Nineveh, and resented the Divine mercy to its repentant people which seemed to falsify his message, the lesson taught him by his withered gourd is thus set forth: "And should not I spare Nineveh, that great city, wherein are more than six score thousand persons that cannot discern between their right hand and their left?" *i. e.*, young children. That the Ninevites and the ancient dwellers on the Euphrates and the Tigris were a right-handed people, appears to be borne out by their elaborate sculptures, recovered by Botta and Layard at Kourjunjik, Khorsabad, Nimroud, and other buried cities of the great plain. The sculptures are in relief, and frequently of a less conventional character than those of the Egyptian monuments, and are consequently less affected by the aspect and position of the figures. The gigantic figure of the Assyrian Hercules—or, as supposed, of the mighty hunter, Nimrod,—found between the winged bulls, in the great court of the Palace of Khorsabad, is represented strangling a young lion, which he presses against his chest with his left arm, while he holds in his right hand a weapon of the chase, which has been supposed to be analogous to the Australian boomerang. On the walls of the same palace the great king appears with his staff in his right hand, while his left hand rests on the pommel of his sword. Behind him a eunuch holds in his right hand, over the king's head, a fan or fly-flapper, and so with the other officers in attendance. Soldiers bear their swords and axes in their right hands, and their shields on their left. A prisoner is being flayed alive by an operator who holds the knife in the right hand. The king himself puts out the eyes of another captive, holding the spear in his right hand, while he retains in his left the end of a cord attached to his victim. Similar evidence abounds throughout the elaborate series of sculptures in the British Museum and in the Louvre. Everywhere gods and men are represented as "discerning between their right hand and their left," and giving the preference to the right.

It thus appears, so far as enquiry has been carried, that everywhere, from the earliest times, any definite information that can be recovered points to the preferential use of the right hand. The ancient Egyptian, Hebrew and Assyrian, the Greek and Roman, and seemingly also the

lettered Mexican of the New World, are all found following a uniform practice. So far as it can be discerned in the action of savage races, the same preference appears; so that, unless we assume the transmission of a primeval usage through all the ramifications of descent from a common ancestry, we must look for some congenital source for such predominating uniformity of law.

Yet this apparent uniformity of practice is not without very notable exceptions, the extent of which still remains to be determined. While right-handedness everywhere predominates, left-handedness is nowhere unknown. The ambidextrous skill of the combatant is indeed a favourite topic of poetic laudation; as in the combat between Entellus and Dares (Æn. v. 457). Where the passionate Entellus strikes, now with his right hand, and again with his left:

> "Præcipitemque Daren ardens agit æquore toto,
> Nunc dextra ingeminans ictus nunc ille sinistra."

But the more general duty of the left hand is as the shield-bearer, as where Æneas gives the signal to his comrades, in sight of the Trojans (Æn. x. 260):

> "Stans celsa in puppi, clipeum cum deinde sinistra
> Extulit ardentem."

The right hand may be said to express all active volition and all beneficent action, as in Æn. vi. 370, "Da dextram misero," "Give thy right hand to the wretched," *i. e.*, give him aid; and so in many other examples, all indicative of right-handedness as the rule. The only exception I have been able to discover occurs in a curious passage in the Eclogues of Stobæus, *περὶ ψυχῆς*, in a dialogue between Horus and Isis, where, after describing a variety of races of men, it thus proceeds: *τοὺς δὲ ἐν τῷ λιβὶ ἀσφαλεῖς εἶναι καὶ ὡς ἐπὶ τὸ πλεῖστον ἀριστερομάχους, καὶ ὅσον ἄλλοι τῷ δεξιῷ μέρει ἐνεργοῦσιν, αὐτοὺς τῷ εὐωνύμῳ προστιθεμένους*, *i. e.*, "While those on the south-west are sure-footed, and for the most part fight with the left hand; and as much force as others exert with their right side, they exert by the application of their left." Stobæus, the Macedonian, belongs, at earliest, to the end of the fifth century of our era, but he collected diligently from numerous ancient authors, some of whom would otherwise be unknown; and here he gives us the only indication of a belief, however vague, in the existence of a left-handed people.

As to the existence of individual examples of left-handedness, the proofs are abundant, alike in ancient times and in our own day.

Hyrtl affirms its prevalence in the ratio of only two per cent. But among the old Benjamites, and the Hebrews generally, it must have been more common; nor can I doubt that the tendency of a high civilization must be to diminish its manifestation. My own attention has been long familiarly directed to it from being myself naturally left-handed, and the experience of upwards of half a century enables me to controvert the belief expressed by Dr. Humphry, on which he founds the deduction that the superiority of the right hand is not congenital, but acquired, viz., that "the left hand may be trained to as great expertness and strength as the right." My own experience accords with that of others in whom inveterate left-handedness exists, and shows the education of a life-time contending with only partial success to overcome an instinctive natural preference. The result has been, as in all similar cases, to make me ambidextrous, yet not strictly speaking ambi-dexterous.

The direct value of such personal experience in determining some of the questions under consideration must be the excuse for a brief reference to its teachings. With an instinctive preference for the left hand, which equally resisted remonstrance, proffered rewards, and coercion, the writer nevertheless learned to use the pen in the right hand, apparently with no greater effort than other boys who pass through the preliminary stages of the art of penmanship. In this way the right hand was thoroughly educated, but the preferential instinct remained. The slate-pencil, the chalk, and pen-knife, were still invariably used in the left hand, in spite of much opposition on the part of teachers; and in later years, when a strong taste for drawing has been cultivated with some degree of success, the pencil and brush are nearly always used in the left hand. At a comparatively early age the awkwardness of using the spoon and knife at table, in the left hand, was perceived and overcome. Yet even now, when much fatigued, or on occasion of any unusual difficulty in carving a joint, the knife is instinctively transferred to the left hand. Alike in every case where unusual force is required, as in driving a large nail, wielding a heavy tool, or striking a blow with the fist, and in any operation demanding unusual delicacy, the left hand is employed. Thus, for example, though the pen is invariably used in the right hand in penmanship, the crow-quill and etching needle are no less uniformly employed in the left hand. Hence, accordingly, on proceeding to apply the test of the hand to the demotic writing of the Egyptians, by copying

rapidly the Turin enchorial papyrus already referred to, first with the right hand and then with the left, while some of the characters were more accurately rendered as to slope, thickening of lines, and curve, with the one hand, and some with the other, I have found it difficult to decide on the whole as to which hand executed the transcription with greatest ease. In proof of the general facility thus acquired, I may add that I find no difficulty in drawing at the same time, with a pencil in each hand, profiles of men or animals facing each other; but the attempt to draw different objects: as a dog's head with the one hand and a human profile with the other, is unsuccessful, owing to the complex mental operation involved. There is thus here what to an ordinary observer would appear to be thorough ambi-dexterity. Nevertheless, while there is little less command of the right hand than in the case of one exclusively right-handed, it is wholly acquired; nor has the habit of half a century overcome the preferential use of the other hand. It may be added that the same influences appear to affect the whole left side, as shown in hopping, skating, foot-ball, &c.

An exaggerated estimate is formed of the difficulties experienced by a left-handed person in the use of a screw-driver, gimlet, scissors, &c. "From the opening of the parlour door to the opening of a pen-knife," says Sir Charles Bell, "his disadvantage is apparent." Much of this is founded in misapprehension. With rare exceptions, habit so entirely accustoms him to the requisite action, that he would be no less put out by the sudden reversal of the door-handle, knife-blade, or screw, than the right-handed man. Habit is thus constantly mistaken for nature. The laws of the road, so universally recognized in England, have become to all as it were a second nature; and as the old rhyme says:

> "If you turn to the left, you are sure to be right;
> If you turn to the right, you are wrong."

Yet throughout British America and the United States, the reverse is the law; and the new immigrant, adhering to the usage of the mother country, is sorely perplexed by the persistent wrong-headedness, as it seems, of everyone but himself.

Yet the predominant practice does impress itself on some few implements in a way sufficiently marked to remind the left-handed operator that he is transgressing normal usage. The snuffers are so peculiarly right-handed as to involve difficulty and awkwardness in spite of the dextrous shift of inserting the left thumb and finger below, instead of

above. The mower's scythe must be used in a direction in which the left hand is placed at some disadvantage; but, like the handling of the oar or canoe-paddle, this difficulty is soon overcome. Even the musket or rifle is designed for a right-handed marksman. It is not uncommon to find a left-handed soldier placed on the left of his company when firing. The writer's own experience in drilling as a volunteer was that, after a little practice, he had no difficulty in firing from the right shoulder; but never could acquire an equal facility with his companions in unfixing the bayonet and returning it to its sheath.

Some cases appear to indicate the hereditary transmission of left-handedness, and on this point further research is very desirable. In my own case a paternal uncle was left-handed. In that of a former pupil, Dr. R. A. Reeve, in whom an original left-handedness has been transmuted into a ready facility with both hands, he informs me that his father was left-handed. Another and more remarkable case has been reported to me of a gentleman in Shropshire, whose father and grandfather were both left-handed. His mother, on noticing an early manifestation of the same tendency in him, employed every means to counteract it. His left hand was bound up or tied behind him so perseveringly, that she only desisted at last under the fear that the left arm had been permanently injured by the constraint to which it had been subjected. Yet all proved in vain. The boy resumed the use of the left hand so soon as restraint was removed; and though learning, like others, to use his right hand in many things, he remains inveterately left-handed. No doubt other cases of a similar character will be found on inquiry.

The conclusion I am led to form, as the result of long observation, is, that with a certain number of persons, the preferential use of the right hand is natural and instinctive; that with a smaller number, an equally strong impulse is felt, prompting to the use of the left hand; but that with the great majority right-handedness is mainly, if not solely, the result of education. If children are watched in the nursery, it will be found that the left hand is offered little less freely than the right. The nurse or mother is constantly transferring the spoon from the left to the right hand; correcting the defective courtesy of the proffered left hand; and in all ways superinducing right-handedness as a habit. As soon as the child is old enough to be affected by such influences, the fastening of its clothes, the handling of its knife and fork, and many other objects in daily use, help to confirm the habit

until the art of penmanship is mastered, and with this crowning accomplishment—except in cases of strongly marked bias in an opposite direction,—the left hand is relegated to its very subordinate place as a mere supplementary organ, to be called into use where the privileged member finds occasion for its aid.

Hence I believe the statistics of right and left-handedness will be found to vary considerably in different conditions of society and ranks of life. Few rustic operations more markedly betray the inconvenience of left-handedness than those of the harvest field; yet so far as myown observation extends, a large field of reapers will rarely be found without one or two left-handed shearers among them. Indeed the greater number of examples of female left-handedness which I can call to remembrance are those I have seen in the harvest field. The importance attached to habits at table, and the enforced uniformity of action by the tutor or governess, tend, in a higher class, to eliminate all but the most inveterate inclination towards a deviation from the practice of the majority. No governess, I imagine, would tolerate the needle in the left hand, any more than a writing-master would allow the pen to be so used. Hence the whole tendency of education is to eradicate or reduce to the lowest minimum all such sinister proclivities; whereas in savage and even in rustic life, any strong bias will be slightly interfered with; and so the left-handed impulse will be free to manifest itself to the utmost. But so soon as combined operations are reduced to any system, the convenience of a uniform preference of the same hand must be felt; and then whatever tendency affects the greater number will give the law to all.

So far as enquiry reaches, we have no evidence of any left-handed tribe or nation, savage or civilized, unless the vague allusion of Stobæus —already quoted,—to a sure-footed and left-handed race, be considered an exception. Either, therefore, the preferential use of the right hand is natural and congenital in a sufficiently large majority of the whole human race to determine everywhere its predominance, or else the arbitrary usage, developed into a habit and recognized law, has been derived from some primitive common source. The latter is a tempting argument, not without its weight in reference to the unity and common intellectual inheritance of the human race. But, notwithstanding the apparent failure of the evidence advanced in favour of an organic one-sidedness finding expression in the prevalent use of the right hand, my own experience of the unconquerable impulse to prefer the left hand,

convinces me that a similar and more general bias in an opposite direction has its origin in organic structure.

The dexterity occasionally manifested by left-handed performers is sometimes regarded with surprise, as though it were accomplished under unusual disadvantages. But such skill as that of the left-handed slingers of the tribe of Benjamin is in no way exceptional. All truly left-handed, as well as all truly right-handed persons, are more likely to be *dextrous* than those who are unconscious of any strong impulse to the use of either hand. The bias, whether to the right or the left, is the result of special organic aptitude. With the majority no well-defined bias betrays any unwonted power, and they merely follow in this, as in so much else, the practice of the greater number. But there is no such difference between the two hands as to justify the extent to which, with the great majority, one is allowed to become a passive and nearly useless member. The left hand ought to be educated from the first no less than the right, instead of leaving its training to be effected, imperfectly and with great effort, in later life, to meet some felt necessity. In certain arts and professions, both hands are necessarily called into play. The skilful surgeon finds an enormous advantage in being able to transfer his instrument from one hand to the other. The acoucheur is no less indebted in critical cases to the prompt command of the left hand. The dentist has to multiply instruments to make up for the lack of such acquired power. The turner, the cabinet-maker, the chacer and die-cutter, who have mastered the same ambidexterity, all experience thereby greater facility in executing some portions of their work. The boxer has to learn the free use of his left hand. The fencer who can transfer his weapon to it, places his adversary at great disadvantage. The lumberer finds the operations of his wood-craft facilitated by learning to chop timber right and left-handed; and the carpenter may be frequently seen using the saw and hammer in either hand, and thereby not only resting his arm, but greatly facilitating his work. In all the fine arts the mastery of both hands is advantageous. The sculptor, the carver, and draftsman, the engraver, and cameo-cutter, each has recourse at times to the left hand for special manipulative dexterity; the pianist depends little less on the left hand than the right; and as for the organist, with the numerous pedals and stops of the modern grand organ, a quadrumanous musician would still find reason to envy the ampler scope which Briareus could command.

In every occupation which admits of the advantageous employment of both hands, the left-handed person has this advantage that, starting as he does with a natural facility in the use of the one hand, many circumstances compel him to the education of the other, and thus he becomes practically ambidextre, or not unfrequently learns to delegate special operations to each hand, as those for which experience and training have best adapted it. Nevertheless the instinctive preference is never eradicated. In every sudden and unpremeditated action the prompt use of the left hand shows that there remains, after the utmost educational training, some inherent impulse, resulting in a greater aptitude in the one hand than the other.

NOTES ON STATICS.

BY JAMES LOUDON, M.A.,
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The following Geometrical proofs of some propositions in Statics were devised by me in the year 1868:

1. Let $OA = r$ be any line; P_1, P_2, ... the forces under which a system is kept at rest; θ_1, θ_2, ... the angles between their directions and OA.

Then forming a closed polygon with the lines representing the forces, and projecting the sides on OA, we have $\Sigma(P \cos \theta) = 0$, and therefore $\Sigma(Pr \cos \theta) = 0$, that is,

$$P_1 . r \cos \theta_1 + P_2 . r \cos \theta_2 + \ldots = 0.$$

But $r \cos \theta$ is the projection of OA on the line inclined to it at angle θ. Wherefore, &c.

2. Let the forces P_1, P_2 ... be in equilibrium, or reducible to a single resultant.

Let p_1 be the perpendicular from O on P_1, δ_1 the perpendicular from A on the plane of p_1 and P_1, &c.

Then forming a closed polygon with the axes of the couples, and projecting the sides on the line OA, we have $P_1 p_1 \cos \theta_1 + \ldots = 0$. But $\delta = OA \cos \theta_1$, &c.; therefore $P_1 p_1 \delta_1 + \ldots = 0$, or $\Sigma(Pp\delta) = 0$.

3. Let a set of forces be reducible to a resultant R acting along OA and a couple G, axis parallel to OB.

Then these can be transformed into R acting at a point O' and a couple G', axis parallel to OO', only when the plane BOO' is perpendicular to the plane AOO', that is, when

$$\cos AOB = \cos AOO' . \cos BOO',$$

as is evident by describing a sphere round O.

4. To find the positions of the momental-planes as the moment-centre (the origin) moves along a given line OA.

Here the forces are supposed reduced to R at O and a couple G, whose plane, the momental plane, passes through O.

Let OA and R be in the plane of the paper, OB the intersection of the momental-plane with the plane of the paper, and OC the projection of the axis of G on the plane of the paper.

Let O' be the new position of the origin on OA, $OO' = r$, $d =$ distance of $O'B'$, parallel to OB, from OB; θ, φ, ψ the angles which the direction of R, the axis of G, and OC make, respectively, with OA.

Then on transferring to O' we have R and the couples G, $Rr \sin \theta$, the resultant of which will be a couple whose axis lies in a plane parallel to OC and perpendicular to the plane of the paper.

Now let $s =$ distance of the line of intersection of the momental-planes at O and O' from O; α the angle between OC and axis of G, β the angle between the momental-planes at O and O', γ the angle between the momental plane at O' and the plane of the paper.

Then $s \cos(\alpha + \gamma) = d \cos(\alpha + \beta)$, or $s \sin \beta = d \sin \gamma$

$$\therefore s = d \frac{\sin \gamma}{\sin \beta} = d . \frac{G}{Rr \sin \theta} = r \cos \psi \frac{G}{Rr \sin \theta} = \frac{G \cos \psi}{R \sin \theta},$$

which is independent of the distance of O' from O.

Therefore, as the moment-centre moves along OA, the momental-planes all pass through the same line, the distance of which from $O = \frac{G \cos \psi}{R \sin \theta}$.

If a plane be drawn through this line parallel to the plane of the paper, and $p =$ distance between these planes, then

$$p = s \cos \alpha = \frac{G \cos \psi \cos \alpha}{R \sin \theta} = \frac{G \cos \phi}{R \sin \theta},$$

since $\cos \varphi = \cos \psi \cos \alpha$.

Therefore the above line may also be determined by the intersection of the momental-plane at O with a plane parallel to the plane of the paper at a distance $= \frac{G \cos \phi}{R \sin \theta}$.

The line so determined and OA are said to be *reciprocal* to one another.

4. When R at O and the couple G are replaced by two forces, one of which acts along the line OA, to find the magnitude and line of action of the other.

Let the forces of G be S acting along OB, and S at a distance $\frac{G}{S}$, the figure being the same as in previous proposition.

Now if the resultant of R and S at O acts along OA, we must have $R \sin \theta = S \cos \psi$

$$\therefore S = \frac{R \sin \theta}{\cos \psi},$$

and therefore the other force acts at a distance $= \frac{G \cos \psi}{R \sin \theta}$, that is, along the reciprocal of OA.

The resultant of R and S at $O = R \cos \theta + S \sin \psi$

$$= \frac{R \cos (\theta - \psi)}{\cos \psi}$$

Therefore the two forces are

$$\frac{R \cos (\theta - \psi)}{\cos \phi} \text{ along } OA,$$

$$\text{and } \frac{R \sin \theta}{\cos \psi} \text{ along its reciprocal.}$$

5. If β be the angle between the axis of G and the direction of R, the values of the forces may be written

$$\frac{R \cos \beta}{\cos \phi} \text{ along } OA,$$

and $\frac{R}{\cos \phi} \{\cos^2 \varphi + \cos^2 \beta - 2 \cos \beta \cos \theta \cos \varphi\}^{\frac{1}{2}}$ along its reciprocal.

6. The shortest distance between the reciprocal lines is evidently p already found in § 4 to be

$$\frac{G \cos \phi}{R \sin \theta}.$$

November 12, 1870.

(To be continued.)

ON THE OCCURRENCE OF COPPER ORE IN THE ISLAND OF GRAND MANAN, BAY OF FUNDY.

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[In a recent description of the Island of Grand Manan, published in the *Canadian Naturalist*, by Professor Bailey, the author makes no mention of a very remarkable copper-deposit which occurs on the west coast of that Island. The following notice of this deposit is extracted from a report printed for private circulation in the autumn of last year.]

1. *General description of the Island* :—The Island of Grand Manan is situated near the mouth of the Bay of Fundy, about ten or twelve miles east of the coast of Maine. It extends in a general NNE and SSW direction, its average length being about twenty-one miles. In breadth, it varies from three or four miles in some places, to seven or eight miles in others. A small strip at the extreme south of the island belongs to the State of Maine; but with this exception the whole of the island is included within the Province of New Brunswick. Saint Andrews, the nearest port of the Dominion of Canada, lies about thirty miles to the north-west.

The eastern coast of the island is comparatively low, and much indented in outline, offering several wide bays and more or less sheltered coves with good anchorage. This side of the island contains one or two saw mills, and also a considerable number of detached settlements, chiefly occupied by fishermen. Towards the central part of the island the ground rises abruptly, and the entire western coast presents an almost unbroken line of high basaltic cliffs, rising vertically to a height of from 200 to 250 feet above the sea level. Below this escarpment, with its slides and talus of heaped and broken rock, there is no true beach, but merely a narrow belt of coarse shingle, covered in many places by huge columns and angular masses of basaltic trap which have fallen from the cliffs above.

The western side of the island, more especially, is densely wooded, and it would thus furnish a practically inexhaustible supply of good timber for mining purposes. Two or three small lakes also occur upon it, and streams emanating from these afford an unfailing supply of water. This point may be especially alluded to, as several valuable mining stations, situated on other islands of the Bay of Fundy, are

greatly impeded in their operations by the want of fresh water for washing and dressing the raised ore.

2. *Geological Features :*—The oldest rocks on the island are a series of metamorphic slates and conglomerates, probably of Palæozoic age. These are exposed chiefly on the north-east side of the island. They dip in various directions, but shew a general inclination towards the south-west. In the accompanying sketch-section these metamorphic strata are denoted by the letter A. They are traversed in places by trap-dykes, partly of an amygdaloidal character, and are covered here there by beds of drift gravel. At the base of the island, on the western side, strata of buff-coloured sandstone crop out, and range along the shore throughout almost the entire extent of this part of the coast. These sandstone beds (lettered B in the section) are apparently of Triassic age. They dip at a slight angle towards the south-west, and must thus overlie the metamorphic strata, somewhat as depicted in the section; but their extent in an easterly direction may be greater or less than is there shewn. Here and there, below the boulders on the shore, they are seen on the other hand to extend in broad layers beneath the sea. A bed of white or pale grey tufa (C), averaging about seven or eight feet in thickness, rests conformably on these sandstones, and is succeeded by a thin layer of soft clay-like tufa (D), the two presenting, in many places, no clearly discernible line of separation. Finally, above the whole of these beds, a mass of columnar and subcolumnar trap (E) forms a huge overflow, its surface sinking down in step-like ridges towards the east, whilst on the western shore, as already stated, it forms a range of high precipitous cliffs, rising almost vertically from the sea.

3. *The Mineral Bed :*—The outcrop of light coloured tufaceous rock (C) referred to above, although covered up in many places by heaps of detrital matter fallen from the cliff, can be traced along the face of the western escarpment throughout a length of eight or nine miles, and it extends undoubtedly beyond this distance. It is shown nowhere, however, in its true position; but only along the face of the slides or *éboulements* which rest against the face of the cliffs throughout the entire length of the island. As thus seen, it occupies a level much below the true position of the bed. The latter must be at least thirty or forty feet above high-water mark; whereas, on the face of the slides, the bed has been brought down in some places to within three or four feet of the water level, and in others to about fifteen or twenty feet. In

these slides, also, the bed has been more or less broken up, and has been made to dip inwards or towards the east, as shewn in the accompanying section, whilst the true inclination is evidently in the opposite direction.

This tufaceous bed carries small patches and stains of earthy malachite or green carbonate of copper apparently throughout its entire length; and where the bed has been excavated to the extent of a few feet, these stains and earthy masses are seen to have arisen from the partial decomposition of small strings and bunches of copper glance or sulphide of copper, one of the richest ores of that metal. Only two excavations, however, have at present been carried into the bed, and neither of these reaches the solid or unfractured rock. But these excavations are about five miles apart, and here and there, on the intervening stretch of shore, pieces of the rock, thickly charged with malachite, or shewing strings of copper glance, occur amongst the detrital matters dislodged from above. It may be fairly concluded, therefore, that the bed carries ore of this character throughout the entire length of its outcrop; but this cannot be absolutely proved without undertaking regular exploratory work, as a comparatively slight shock at the foot of the cliff is sufficient to bring down many tons of rock and stone. This tendency to fall is in great part due to the face of the cliff being composed of vertical columns of basalt, which separate readily at the partings. On the actual face of the outcrop, the show is in many places very poor. Here and there, for the space of a couple of fathoms or more, merely a few faint stains are observable, but in other places distinct patches of malachite occur. The ore appears to have been greatly decomposed near the face of the outcrop, partly, perhaps, by the action of sea-water; and it may thus, in course of time, have been gradually dissolved out or washed away. The water which infiltrates in places through the bed, holds evident traces of copper salts, as a film of metallic copper has been found on picks and hammers accidentally left in contact with it. The first three or four, or perhaps five feet of the bed (measured from the face of the outcrop generally,) will not certainly give an average yield of one per cent. of metal; but at a distance of ten or twelve feet, if the present excavations may be taken as a criterion, a yield of at least five or six per cent. may be anticipated (see Assays in § 4). Copper glance contains normally 79·8 per cent. of metallic copper: the presence of a comparatively small amount is sufficient, therefore, to form a paying ore. Malachite, also, although a

hydrated carbonate of copper, is comparatively rich in metal, as the copper in pure samples exceeds 57½ per cent.

4. *Results of Assays.*—A small sample shewing faint stains, from the face of the outcrop, yielded in metallic copper only 0·21 per cent. Another sample, also from the face of the outcrop, but containing small specks of earthy malachite, yielded 0·73 per cent. A sample taken from about twelve feet from the edge of the outcrop, and weighing nearly five pounds, gave 9·86 per cent. Two other samples gave respectively 4·63 and 6·15 per cent. Finally, a small sample from the same place, containing numerous strings of copper glance, yielded no less than 22·16 per cent. A piece of rock of about half a pound weight, picked up on the shore about a mile from the excavation which furnished the above samples, gave 4.58 per cent. metallic copper. Discarding the very rich and the very poor specimens, as exceptional examples, the results of these assays indicate an average yield of rather more than 6 per cent. But with the exception of the sample found upon the shore—and this may have been rolled there by the set of the tide, or dropped by some one passing the spot—these samples, it must be remembered, were obtained from a single spot of very limited extent, and hence they may not indicate in any way the true yield of the entire bed.

If the ore, allowing for loss, average 5 per cent. metal, each cubic fathom will contain about 2,020 lbs. of copper, and will weigh about eighteen English tons. Taking the mean thickness of the bed at only six feet, and assuming it to extend eastward, with the same yield of metal, to a distance of ten fathoms only, each mile in length will comprise 8,800 cubic fathoms of copper-holding rock, and will carry 7,890 tons of metal, worth, at the present low price of copper, about £580,000. In reference to this calculation, however, it must be observed that although the bed will probably be found to extend eastwards to a much greater distance than ten fathoms, its richness may not be constant throughout that distance; nor may the assumed yield be found to hold good, from fathom to fathom, along the entire length of the bed. On the other hand, the small strings of copper glance, as seen in the samples hitherto obtained, may thicken and form a network of ramifying veins, running in a general north and south direction—and in that case, the returns would be greatly in excess of the above estimate. It will thus be seen that in the present undeveloped state of the deposit, no definite conclusion can be arrived at respecting its true value.

5. *Proposed Exploratory Work.*—The extension of this copper-holding bed in a north and south direction may be regarded as fully proved; and it is equally certain that at particular spots the bed carries a profitable amount of ore. But the width of the bed, or its extent in an eastward direction, is altogether unknown; and it cannot consequently be predicted with certainty that the ore will be found in paying quantity throughout the bed generally. To determine these latter points, it will be necessary to carry a drift into the solid portion of the bed, the character of the ground precluding other modes of exploration. This drift should be run, in my opinion, from a point in the south side of the ravine which opens into Little Dark Harbour. The ravine in question cuts the strata of this western part of the island almost at right angles. If the drift, consequently, be started in this ravine at a sufficient distance from the shore, and at the proper elevation, it will prove the width or extension of the bed, to that distance at least, directly it strikes the solid rock; whereas, if started on the shore face of the escarpment, it will prove nothing until carried far into the bed; and the amount of tumbled rock and detrital matter, to be removed or passed through, will be about the same in either case. The distance of Little Dark Harbour from Sloop Cove, where the present excavation in the fallen rock matter has been opened, is about two and a-half miles. The cost of an exploration of this character would probably amount, on a rough estimate, to about two thousand five hundred or three thousand dollars—a certain outlay being required for preliminary expenses, in putting up shelter for the men employed, fixing forge and powder house, laying in provisions, &c.

6. *Working conditions of the Copper-holding bed, and general conclusions.*—The working conditions of this deposit are sufficiently favorable. The rock is comparatively soft, aud is thus easily mined. The post and stall system would be employed in its removal. If the roof required additional support, plenty of suitable timber could be obtained on the island. The chief defect with regard to the ore, is the impossibility of concentrating it by dressing, without at least a very considerable loss. It might be cobbed or hand-dressed to a slight extent, but would otherwise have to be treated in bulk. The gangue is a silicate, free or nearly so from carbonate of lime. All things considered, a wet process for the extraction of the copper would give the most satisfactory results. If the ore be found to retain its present character, indeed, no other system could be profitably employed. It is

also evident that the ore could not be exported, to be reduced elsewhere, but the extraction of the copper must be carried on at the mine itself. The necessary works could only be erected on the summit of the cliff, as the exposed shore presents no site for this purpose, and the intersecting ravine at Little Dark Harbour is apparently too contracted for the erection of suitable buildings; but no difficulty need be apprehended on this account. By the formation of slides on the cliff-face, the ore could be run up by various known methods, abundant water-power being available on the higher ground for that purpose. Until further exploration be effected, however, the erection of reducing works, or expenditure of capital in fitting the ground for permanent mining occupation, cannot be legitimately recommended.

ANOMALOUS PRODUCTION OF OZONE.

BY HENRY H. CROFT,
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About six years ago, when evaporating some syrupy Iodic Acid, prepared according to Millon's process, over sulphuric acid I noticed that when the acid began to crystallise, the air in the jar (covering the drying dish) had a strong smell of ozone, or active oxygen. A couple of years afterwards, on again making iodic acid, this observation recurred to my mind, and I carefully tested the air in the jar during the evaporation; no trace of ozone could be detected until the acid began to crystallise, when the smell of ozone became immediately perceptible, and all the usual tests for that body succeeded perfectly.

During the last month I have had occasion to convert two ounces of iodine into iodic acid, and exactly the same result has been observed.

The acid usually solidifies to opaque verrucose masses; but on this occasion, the crystals formed were clear and brilliant. The solution had in this, as in all the former cases, been boiled down to thin syrup, so that no trace of chlorine, or nitric acid, could possibly have remained to act on the ozone paper. The air in the jar was tested from day to day, both by the smell, and the action of iodised starch paper. Even when a few crystals began to form no change was noticed, but when the crystallisation set in fully the evolution of ozone was most remark-

able, the strong smell being quite characteristic, entirely different from that of chlorine or nitric acid.

I am quite unable to account for this ozonification of the air (or oxygen) over crystallising iodic acid. My friend, Mr. Sterry Hunt, has suggested that it may arise from a partial deoxidation similar to that which produces ozone when hypermanganates are decomposed, as observed by him and other chemists. As the crystallizing acid remains perfectly white, either opaque or transparent, and as the lower oxides of iodine are of a yellow, or even brown colour, according to Millon, I cannot accept this explanation, and even if it were true, the phenomenon would be equally unintelligible—a reduction taking place during crystallisation. I can offer no explanation of the *simple fact* that air over crystallising pure iodic acid, becomes ozonised, but I think that the observation seems to offer a wide field for futher experiments, which I have unfortunately not the time to carry out.

LAHONTAN.

BY THE EDITOR.

The ordinary biographical notices of the Baron LAHONTAN are very meagre. In the books of reference nearest at hand, his name does not appear at all. It is absent in Morgan's Sketches of Distinguished Canadians, or Persons connected with Canada, in Appleton's Cyclopædia of Biography (New York), and in Thomas's Universal Pronouncing Dictionary of Biography (Philadelphia). As his name comes up in connexion with the very early history of Toronto, I have thought it expedient to draw up a brief memoir, to be appended to a series of papers on that subject. My sources of information will chiefly be incidental autobiographical notices scattered up and down his own pages. Such a memoir may also possess a general interest, as all those who concern themselves with the literature of early Canadian and North American history generally, must look into the Nouveaux Voyages dans l'Amérique Septentrionale, and so will naturally desire such detail of the author's history as may be had.

The complete title page of the copy now before me is, when translated into English, as follows: "New Travels, by Mons. le Baron de Lahontan, in North America; containing an account of the different

Tribes inhabiting that region, the character of their Governments, their Commerce, their Customs, their Religion and their mode of Warfare. Also the interest which the French and English have in commercial dealings with those Tribes; the advantage which England has it in her power to gain in that country, when at war with France. The whole enriched with Maps and Engravings. The Hague. L'Honoré, Brothers, Merchant Booksellers. 1703." The work is in two volumes, small 12mo. On the title page is L'Honoré's device, a winged Fame, seated amidst symbols of learning and science, presenting a wreath: the whole surrounded by the legend, which is a play on the publisher's name, *Honoratus que virtutem Honorat.* A mysterious double frontispiece precedes: one side gives a globe floating in space, with a swallow flying; and the legend *Orbis Patria:* the other shows an Indian, bearing an arrow and bow, and setting his right foot on a crown and sceptre, and his left on a clasped volume: above is the legend, *Et leges et sceptra terit.* All this is to give a hint (1) of the cosmopolitanism; (2) of the admiration of the free and independent "savage" character, affected by the author.

The work itself is perhaps of no very great intrinsic value. Most of its solid information could be gleaned, if necessary, from other existing sources, contemporary or anterior in time. I think the book was brought out somewhat as we see books brought out occasionally now. It was a narrative which the publisher and author thought would sell, in consequence of the situation of European affairs at the moment.

War had recently been declared between France and England. Not only on the continent of Europe were the troops of William III. and Louis XIV. in active conflict, but collisions were taking place between the conventional adherents of the two potentates in the remote world of North America; and here was a writer coming forward fresh from the scene of action; one who had actually taken part in the hostile operations on the western side of the Atlantic.

The maps and engravings with which the volumes were "enriched" look, at the present day, sufficiently rude and quaint. In the English edition the author complains of the mistakes of the Dutch engravers, in the illustrations of the edition published at the Hague. He says: "I have corrected almost all the cuts of the Holland impression, for the Dutch gravers had murdered them, by not understanding their explications, which were all in French. They have graved women for

men, and men for women; naked persons for those that are clothed, and *è contra*. As for the maps," he adds, "the reader will find them very exact; and I have taken care to have the tracks of my voyages more nicely delineated than in the original."

About the same period too, the public mind had been roused by accounts of recent additional discoveries on the great continent of North America. In Thévenot's Collection of Travels, published at Paris in 1681, there was an account of the discoveries of Marquette. In 1683, Louis Hennepin had published, also at Paris, his "Description de la Louisiane au sud-ouest de la Nouvelle France, avec la carte du pays, les mœurs et la manière de vivre des Sauvages. Paris, Seb. Hure. 1683;" and in 1697 the same writer had put forth at Utrecht his "Nouvelle Découverte d' un très-grand Pays situé dans l'Amérique, entre le Nouveau Méxique et la Mer Glaciale;" and in the following year, at the same place, appeared his "Nouveau Voyage d'un pays plus grande que l'Europe entre les Mers du Sud et du Nord, avec les Mœurs et Manières de vivre des Sauvages." In 1697 also, Tonti's "Narrative of La Salle's Descent of the Mississippi to its Mouth," appeared at Paris. These works were doubtless meeting with a sale that was deemed large in those days, and were making no small stir. More matter of the kind indicated by the foregoing titles, would be calculated to meet with acceptance. Lahontan accordingly, in addition to an account of events in Canada from 1683 to 1694, admits into his work a highly dressed-up narrative of an excursion of his own up one of the northern branches or affluents of the Mississippi; a narrative which he makes the vehicle of a variety of reports of people and places, of new lakes and seas to the south and west, collected from Indians casually met with by himself in his expedition. It is the letter or chapter which contains this particular narrative, that has brought a degree of discredit upon Lahontan, and caused other parts of his book, to which no particular improbability attaches, to be questioned.

It would seem as if his informants up the Long River, as the branch of the Mississippi which he is said to have explored was called, meeting with a person apparently easy of belief, had in some instances fooled him probably as they thought, to the top of his bent; and only too faithfully did Lahontan transfuse into his pages the spirit of the fabulists whom he encountered.

By evil communications with the Iagoos of the Red men, he came to be classed among Iagoos himself, more completely than he perhaps in reality deserves.

"Very boastful was Iagoo:
Never heard he an adventure,
But himself had met a greater;
Never any deed of daring,
But himself had done a bolder;
Never any marvellous story,
But himself could tell a stranger."

Everything, however, should not be set down as intentional extravagant representation on either side. There must necessarily have been many misunderstandings on the part of both traveller and informants, arising out of mistakes in language and idiom, and from interpreters not familiarly comprehending the dialects which they professed to translate. On one occasion, after questioning some natives far up the river which he had penetrated, we have Lahontan's own remark: "This was all I could gather. My curiosity prompted me to desire a more particular account; but unhappily I wanted a good interpreter; and having to do with several persons who did not well understand themselves, I could make nothing of their incoherent galimatias." He then adds: "I presented the poor, miserable slaves with something in proportion to the custom of the country; and endeavoured to persuade them to go with me to Canada, by making them such offers as in their esteem would appear like mountains of gold; but the love they had for their country stifled all persuasions; so true it is, that nature, reduced to its just limits, cares but little for riches." The "poor, miserable slaves" were four captives in the hands of the tribe visited farthest up the river. These captives were said to belong to a people called the Mozeemleks. They had a thick, bushy beard, and their hair hung down under their ears: he should have taken them, from their general appearance, he says, to be Spaniards. Here is a specimen of the information these captives gave him, whatever it was worth: "The Mozeemlek nation is numerous and powerful. Its principal river, they said, rose on the other side of the mountains, which were six leagues across; and after a course of 150 leagues, it emptied itself into a salt lake 300 leagues in circumference, by a mouth two leagues broad. The lower part of that river, they said, is adorned with six noble cities, surrounded with stone, cemented with fat earth. The houses of these cities have no roofs, but are open above, like a platform. Besides these cities, there are above a hundred towns, great and small, round that quasi sea, on which they sail in large boats. The people of that country made stuffs, copper axes, and several other manufactures,

of which my interpreters could give me no idea," he remarks, "as being themselves altogether unacquainted with such things. The government was despotic, they said, and lodged in the hands of one great chief, to whom the rest paid a trembling submission. The people upon the lake referred to called themselves Tahuglauk, and were as numerous as the leaves of trees. The Mozeemlek people supply the cities and towns of the Tahuglauk with a great number of small animals, of the size of a calf, which they catch on the mountains. The Tahuglauk make use of these small animals for several purposes: they not only eat their flesh, but bring them up to labour, and make clothes, boots, and so on, of their skins." The people among whom Lahontan met with these four captives are called by him Gnacsitares. The captives said they had been taken prisoners by the Gnacsitares in a war, which had now lasted eighteen years, between that people and the Mozeemlek; but that they hoped a peace would be speedily concluded, upon which the prisoners would be exchanged, pursuant to custom. They boasted that the Mozeemlek possessed a greater measure of reason than the Gnacsitares could pretend to; that the Mozeemlek confessed in the Gnacsitares only human form; otherwise they regarded them as brute beasts. "To say my mind," Lahontan observes, "their notion upon this head is not so very extravagant; for I observed so much honour and politeness in the conversation of these four captives, that I thought I had to do with Europeans. But after all, I must confess," he says, "the Gnacsitares are the most tractable I met with among all the savages." After describing some pieces of wrought copper which they had in their possession, he proceeds to say: "I could pump nothing further out of them in relation to the country, commerce and customs of that remote nation. All they could say was, that the Great River of that nation runs all along westward, and that the Salt Lake into which it falls is three hundred leagues in circumference and thirty in width, its mouth stretching a great way to the southward. I would fain have satisfied my curiosity in being an eye-witness of the manners and customs of the Tahuglauk; but that being impracticable, I was forced to be instructed at second-hand by these Mozeemlek captives, who assured me, upon the faith of a savage, that the Tahuglauk wear their beards two finger-breadths long; that their garments reached down to their knees; that they cover their heads with a sharp-pointed cap; that they always carry a long stick or cane in their hands; that they wear a sort of boots, that reached up to the knee; that their wives are

never seen in public," &c. &c. It may be observed that Marquette, on whose narrative no doubt rests, heard, when at the mouth of the Missouri, several years previously, of a portage up that river, across a prairie of only five or six days' journey, by which a river running west into the sea could readily be reached. This sea he believed to be the Pacific Ocean; and "If God gives me health," Marquette added, "I do not despair of one day making the discovery."

It was, as we have said, the contents of his 16th chapter or letter, that brought the rest of Lahontan's book into disrepute. The information gathered from his aboriginal authorities was evidently not to be relied on. The details of his own journey to the country of the so-called Gnacsitares, its stages and distances, were also glaringly incredible. No sane person who reflected for a moment could believe that it was possible in the months of December, January, February and March—these were the months taken up with his too-famous excursion—to conduct a flotilla of boats with a considerable body of soldiers, and a number of native guides and attendants, with a store of provisions and arms, and apparently an unlimited supply of presents, up and down an extensive North American river in the latitudes in which the newly-explored river was supposed to be situated—especially to do it with the magical facility with which Lahontan represents himself to have accomplished the feat. I do not think that he ever expected his story, as contained in this chapter, to be taken as literal truth by any one who should trouble himself to think seriously on the subject. The utter extravagance of the map, too, which he gives in illustration of his jaunt, was an admonition, as I take it, that the whole thing was a piece of rhodomontade. He records, in fact, upon the face of the chart, that the most important portion of it was drawn for him on a piece of buck-skin by his friends the Gnacsitares, "who gave me to know," he adds in the same memorandum, "the latitudes of all the places marked in by pointing to the respective places of the heavens that one or other corresponded to; for by this means I could adjust the latitude to half a degree or little more; having first received from them a computation of the distances in Tazous, each of which I compute to be three long French leagues." The part of the Rivière Longue (or Rivière Morte, as he says some persons call it), explored by him, he sketched out on his map in continuation of the stream as drawn by his friends the Gnacsitares, making it appear a river fully as large and important as the Mississippi itself.—One might almost imagine that he desired to

bring ridicule upon the reported discoveries of other travellers in the in the west, and in particular on Marquette's map of the Lower Mississippi, which probably he had seen and through prejudice perhaps discredited—a map which, though drawn in good faith, represents the relative magnitudes of the principal river and a number of its affluents very incorrectly, as was to be expected in a first rude unscientific delineation, made simply by the aid of the eye.

As to the river which Lahontan visited, and, to some extent, explored, it is supposed to be that known at the present time as St. Peter's, or Minnesota River, which enters the Mississippi at Fort Snelling. St. Peter's or Minnesota River anywhere else would be considered a stream of considerable magnitude. Its entire length is estimated at four hundred and fifty miles. It is navigable at high water, for steamsteamboats, sixty miles from Fort Snelling. It is suggested in Perkins' Annals of the West, p. 20, published at Cincinnati in 1846, that "the baron entered St. Peter's when filled with the back waters of the Mississippi, and that he heard from the Indians of the connection by it and the Red River with Lake Winnipeg, and the communication between that lake and Hudson's Bay by Nelson River, and looking westward all the while, turned Hudson's Bay into the South Sea." In sailing, and other modes of locomotion, a person's head is sometimes turned about, as the expression is. Perkins' hypothesis would require us to imagine that some such confusion in regard to the points of the compass had arisen in the mind either of Lahontan or of his informants. It is more reasonable to imagine that Lahontan on this occasion, and at other times in the course of his wanderings, fell in with Indians acquainted in some degree, either by experience or by hearsay and oral tradition, with the well-beaten trails leading across from the head-waters of the Missouri to the head-waters of the Colorado. In this case the Salt Lake spoken of will have meant the Gulf of California, with stories and traditions mixed up, of the stone-built cities of Mexico and Central America, which, as we know, were by no means myths. In Nicollet's Report to Congress in 1843, it is supposed that Cannon River is the one entered by Lahontan; and Nicollet accordingly names that stream "the River Lahontan." The whole length of Cannon River, however, is only 80 miles.

The account which Lahontan gives of the origin of his book is is this: On leaving France for Canada, on military duty, he promised an aged relative of his, to whom he was indebted for an annual allow-

ance of money, a letter from time to time, containing a narrative of occurrences in Canada, with descriptions of the natives and natural productions of the country.

These letters were not in the first instance intended for publication, but having occasion to apply to the government of France for protection against what he deemed to be an unjust proceeding on the part of one of the courts of the country, and thinking that his professional services in Canada were not sufficiently recognized, he decided at length to communicate to the public what was at first intended only for the eye of an interested patron and relative. The letters, of which he had retained copies, he accordingly allowed to be printed, just as they were, affected all of them, more or less, by a desire to amuse and please his aged benefactor, and to make, in his eyes, a respectable shew of enterprise and military tact, of spirit and efficiency.

It is well known that a few years previous to the publication of the "Nouveaux Voyages dans l'Amérique Septentrionale," the heroic La Salle had obtained important distinctions and advantages from Louis XIV. through personal representations at Court of his enterprises and discoveries. Lahontan, baffled by the opposition that had been excited against him in the mind of the French minister, desired to imply by his book that he was as much entitled as La Salle to the favours of the Government.—And, in truth, it is not improbable that Lahontan would have succeeded with the authorities at Paris, almost as well as La Salle, had he been a man somewhat different; endowed, at all events, with a little more prudence. We find that a good deal of consideration was really shewn him in view of certain family losses, and that an appointment of some dignity was given him in Newfoundland—an appointment, however, speedily rendered untenable by disagreements between himself and his superior officer.

In Canada, likewise, Lahontan's independence of character brought trouble upon him. He ventured to find fault with the proceedings of the Jesuit association—a body apt with some adroitness to represent opposition to itself as hostility to religion. It is chiefly to the official "Relations" of the Jesuits, and other productions of theirs, that he refers when he says, in the Preface to his Travels: "A good many works on the same subject (*viz.*, North America) have already been given to the public but they all labour under the essential defect of a want of disinterestedness and sincerity. They are all of them the productions of missionaries,—that is, of a class of men, bound by their

very profession to persuade the world that their labours, praiseworthy as they otherwise are, are not wholly without fruit. Hence it happens that, speaking strictly, their narratives are nothing more at bottom than a detail of masses said, of miracles, of conversions, and other particulars directly fraudulent, which the good sense of the present age does not readily accept. In a word, the authors in question, urged forward by a zeal, true or pretended, have written more for a cause than for the purpose of making the reader acquainted with what really happens in a country."

And again, in the Preface to the English edition, he says, "Notwithstanding the veneration I have for the clergy, I impute to them all the mischief the Iroquois have done to the French colonies in the course of a war that had never been undertaken, if it had not been for the counsels of these pious Churchmen." He adds that his strictures would have been severer had he not restrained his pen out of regard to the prejudices of his aged relative. "He hears now," he says, "that some pedants are set to work to lash me in writing; and so I must be prepared to stand a shower of insults that will be poured upon me in a few days. But it is no matter," he continues, "I am so good a conjurer that I can ward off any storm from the side of Paris. I laugh at their threats, and since I cannot make use of my sword, I will wage war with my pen."

Having shown himself indisposed to an unreasoning deference in quarters where, in his day, such a homage was exacted and rendered, it is not to be wondered at that Lahontan failed to conciliate the goodwill of every one, either in Canada, Newfoundland or France, and that his name should occasionally be referred to in a tone that sounds slightly vindictive.

The brief article in Watkins' Biographical Dictionary of the year 1807 is derived from a French work entitled "Nouvelle Dictionnaire Historique," and it reads as follows: "A native of Gascony, in the seventeenth century, who published his Travels in North America, written in a barbarous style. He was an officer in the French service, from which he was dismissed for bad conduct, and at length settled in Denmark." Again, in his "Genius of Christianity," Chateaubriand has a scornful reference to Lahontan: "When the Jesuits published the valuable correspondence known as the 'Lettres Edifiantes,' the work was universally quoted and studied. Reliance was placed on its authority and the facts related therein were held to be indubitable.

But it soon became the fashion," he complains, "to decry what had been admired. Being written by Christian presbyters, could these letters, it was asked, be of any real value? Writers were not ashamed," he finally adds, "to prefer, or to affect to prefer, to the travels of such men as Dutetre and Charlevoix, those of a Baron de Lahontan, an ignorant man and a liar."

It is at Lahontan that Charlevoix himself probably glances when he says (Journal, 66): "There are some travellers who make no scruple to fill their journals with whatever they hear said, without troubling themselves about the truth of anything. You would not, doubtless, have me follow their example, and impose upon you for truth all the extravagant things that have been placed to the account of our savages, or that have been taken as they could from their traditions. These traditions, on the other hand, are so little to be relied on, and almost always contradict each other so grossly, that it is almost impossible to discover anything from them that may be depended on." And in the same writer's account of the interior of the church of the Jesuits at Quebec: "I do not mention," Charlevoix says, "*the four great cylindric massive columns, made of one block, of a certain Canadian porphyry, black as jet, without spot or vein*, with which it pleased the Baron de Lahontan to enrich the grand altar. They would certainly be much better," he continues, "than those they have, which are hollow and coarse imitations of marble [grossierement marbrées]. But this author might easily obtain pardon, if he had disguised the truth only to adorn the churches." And again: Charlevoix names Lahontan in connection with the fur-trade of Montreal, at the same time giving a sense to Lahontan's words which they do not possess. "If you meet, madam, by chance, with the book of Lahontan," says Charlevoix to la duchesse de Lesdignieres, to whom his Journal is addressed, "where mention is made of this fair [the periodical trade-sale of furs at Montreal], I would have you take care how you give credit to what he says of it: he does not even preserve probability. The women of Montreal never gave any foundation for what this author reports of them," &c. What Lahontan had said was: "Vous seriez surpris de voir les débauches, les festins, les jeux et les dépenses que ces *coureurs de bois* font tant en habits qu'en femmes, dès qu'ils sont arrivés." He then explained that he referred especially to the unmarried *coureurs de bois:* these, he said, on returning to Montreal, after their lengthened absences in the forest, behaved "comme les matelots

qui viennent des Indes ou de faire des prises en course;" the application of which language was plainly not so wide as Charlevoix insinuates to the French duchesse.

Finally, the Jesuit partisans pronounced Lahontan nothing better than a "savage," to which reproach he ingeniously replied, in the English edition of his work: "These observators do me a great deal of honour, so long as they do not explain themselves so as to make me directly of the same character with that which is tacked to the word "savage" by the Europeans in their way of thinking; for in saying only that I am of the same temper with the savages, they give me, without design, the character of the honestest man in the world." The anticipated charge of barbarism in style he had already endeavoured to soften in the Preface to the first edition of his travels, in the following way: "The style of our author," he says, "will appear perhaps not the most pure and polished; but this very thing ought to render him less exposed to the suspicion of affectation; and besides, what else could be expected from a youthful officer of marines? One thing, however, is certain, which no discerning reader will fail to see: the writer applies himself solely to the simple exposition of facts; he flatters nobody; he disguises nothing; and there may be justly attributed to him what is essential in all good narrators, the characteristic of writing (without prejudice to his duty to his God and his king be it said) as though he himself had neither country nor creed." "His travels are written in a barbarous style," also asserts the Nouvelle Dictionnaire Historique, quoted above. That is, as we suppose, his sentences appear to the French critic to want airiness and epigrammatic point. The English reader, however, will not consider Lahontan's style so very much amiss; he will regard it, probably, as simply natural and straightforward.

(*To be continued.*)

[Passages in Lahontan's Travels, of interest to the historian of Toronto, are the following,: In his twenty-third letter—

"Since we cannot destroy the Iroquois with our single forces, we are necessarily obliged to have recourse to the savages that are our allies; and it is certain, as they themselves foresee, that if these barbarians could compass the destruction of our colonies, they would themselves be subdued by them sooner or later, as it has happened to many other nations: so they know it to be their interest to join with us to destroy these banditti. Now, since they are well affected to this design, we

must endeavour to facilitate to them the means of putting it in execution; for you may easily believe that these people, savage as they are, are not so void of sense as to travel two or three hundred leagues from their own country, to fight against their enemies, without being sure of a place of retreat, where they may repose themselves and find provisions. There is no question, therefore, but we should build forts upon the lands of the Iroquois, and maintain them in spite of their teeth. This, sir, is what I proposed above a year ago to M. de Frontenac, and it is what he would have me still to undertake. I project, therefore, to build and maintain three forts upon the course of the lakes, with some vessels that shall go with oars, which I will build according to my fancy; but they being light and of great burden, may be managed either with oars or a sail, and will also be able to bear the shocks of the waves. I demand fifty seamen of Biscay, for they are known to be the most dexterous and able mariners that are in the world. I must also have two hundred soldiers, chosen out of the troops of Canada. I will build these small fortresses in several places; one at the mouth of the Lake Erie, which you see in my map of Canada, under the name of Fort Supposé, besides two others. The second I will build in the same place where it was when I maintained it in 1687 and 1688, whereof I have written to you in my fourteenth and fifteenth letters; and the third at the north of the Bay of Toronto, upon the same lake. Ninety men will be sufficient to garrison these three redoubts, and perhaps a smaller number; for the Iroquois, who never saw a cannon but in a picture, and to whom an ounce of powder is more precious than a louisd'or, can never be persuaded to attack any kind of fortification."

Again, in a brief general description of Canada, which he sends his relative, after giving some account of Hudson's Bay and the country round Lake Superior, he proceeds: "From the Superior or Upper Lake, I steer to that of the Hurons, to which I allot four hundred leagues of circumference. Now, to make this lake, you must sail down by the Fall called Sault Ste. Marie, which I described in my fifteenth letter. This lake is situated in a fine climate, as you will perceive from the map. The north side of it is best for the navigation of canoes, by reason of the frequency of the islands, which afford shelter in bad weather. The north side is pleasanter, and more convenient for the hunting of deer, which are there very plentiful. The figure of this lake comes near to an equilateral triangle. Of all its islands, that called Manitoualin is the most considerable, being above twenty leagues long

and ten broad. In former times, Ottawas, of the nations Talon and Sable, dwelt in it; but the dread they were under, on account of the Iroquois, obliged both them and their neighbours to retire to Michilimackinac. That part of the continent that faces this island is inhabited by the Nockes and Mississagues, in two different villages, which are twenty leagues distant the one from the other. Towards the east end of this island we fall in with French River, which I took notice of in my sixteenth letter. It is as broad as the Seine at Paris, and runs not above forty leagues in length from its source in the Lake Nipissing to its mouth. To the north-east of this river there lies the Bay of Toronto, which is twenty or five-and-twenty leagues long, and fifteen broad at its mouth. This bay receives a river that springs from a little lake of the same name, and forms several cataracts that are equally impracticable both upon the ascent and descent. Upon the side of this river you will see a man's head marked in my map, which signifies a large village of the Hurons, that was destroyed by the Iroquois. You may go from the source of this river to the lake Frontenac, by making a land carriage to the river of Tanaouaté [the Humber], that falls into that lake. Upon the south side of the Bay of Toronto you will see the fort called the Fort Supposé, which I mentioned in my twenty-third letter; and about thirty leagues to the southward of that, you find the country of the Theonontate, which, being formerly inhabited by the Hurons, was entirely depopulated by the Iroquois."

And again, after describing Lake Erie, and coming to Lake Frontenac, he repeats his information in regard to the route from that lake to Lake Huron: "On the north side," he says, "we meet with several little gulfs. You may go from this lake to that of the Hurons by going up the river Tanaouaté [the Humber], from whence you have a land carriage of six or eight leagues to the river of Toronto [the Severn]."

THE LATE PROFESSOR HINCKS.

At the opening meeting of the session or the Canadian Institute for 1871–2. the President referred to the recent death of Professor Hincks in the following terms:

Before proceeding to the business of the evening it will be becoming in me to give some expression to that feeling of deep loss which I am sure the members of the Canadian Institute experience in being deprived by death of the presence amongst them of the late Professor Hincks. He was, as you know, for two years our President, for several years the editor of our *Journal*, and from the moment of his arrival in Canada to the day almost of his decease an active member of our body, furthering its objects, promoting its well-being, and sustaining its reputation, as well by his written and oral communications, as by his exertions otherwise, and ready help on every possible occasion. I need but allude to the heartfelt regret which we feel at the thought that we are to see his face no more; that we are no more to hear amongst us his earnest animating voice. The time is so very recent when we beheld him visibly before us, no laboured description is required to recall to our minds his form, his air, his manner of speech. Himself sincerely enjoying to the minutest tittle the wide and varied subject-matter of his own special departments of study and research, it was to him manifestly a never-failing pleasure to share with others every particle of the light and information which yielded to himself so much hearty satisfaction; and I doubt not there are many here who will ever associate numerous welcome additions to their own mental stores with words uttered by Professor Hincks,—words always so telling and interesting, on the one hand by reason of their real value, and on the other in virtue of that slight tincture of archaism in their combination and delivery, which was suggestive of a literary and scientific school now beginning in the mother country to be regarded as historical.

Most of the papers by the late Professor that enrich the pages of the *Canadian Journal* were read, as you know, before the Institute. Several of them will furnish material for the use of scientific men engaged especially in Canadian investigations; as, for example, his paper in Vol. vi., p. 165, entitled a "Specimen of the Flora of Canada," and another in Vol. vii., p. 446, "Materials for a Fauna Canadensis." Other papers contributed by him on subjects connected with his especial department of science are "Natural History in its relation to Agriculture," "Considerations respecting anomalous vegetable structures," "The Family of Falconidæ," "On some questions in relation to the theory of the structure of plants of the orders Brassicaceæ and Primulaceæ," "Remarks on the classification of Mammalia," "An attempt at an improved classification of Fruits," "The Struthionidæ," "On Molluscous Animals," "The Grallatores," "An Improved Arrangement of Ferns," &c. Within his especial department his range was, as we see, wide. He did not, however, confine himself to such limits. In the *Journal* we have contributions of his on metaphysical and social-science questions; as, for example, "The Sensational Philosophy," "A new Theory of Human Emotions," "Thoughts on Belief and Evidence," "The true aims, foundations and claims of Political Economy," "On the Interchange of Commodities

between Individuals and Nations," "Economical Questions bearing on Canada," &c. Linguistics, too, had been cultivated by him through an hereditary predilection; but no papers of his on that subject appear in our *Journal.*

Our regrets for the loss of Professor Hincks are shared by the University of Toronto, and by numerous members of the community at large. Many of the youth of Western Canada gratefully acknowledge their intellectual indebtedness to him. They have derived from him a precious discipline of the powers of observation, with apt methods of analysis and classification. Through him there has been enkindled within some of them an ardour in the pursuit of particular studies in Natural Philosophy which will be quenched only, as in their instructor, with life; with such effect, in their case, did he speak of "trees, from the cedar that is on Lebanon, even unto the hyssop that springeth out of the wall; of beasts, and of fowl, and of creeping things, and of fishes;" nor did he fail to turn the thoughts of his auditors, at all fitting moments, to the infinite perfection of the Divine handiwork in every organism and object.

Not to speak of the amount of quiet personal happiness secured to individuals through the zest added to everyday life by the possession of an eye taught how to see, and a mind taught how, in some degree, to interpret the things seen, results of vast moral and material advantage to the whole of Canadian Society must in due time accrue from so large a portion of the community having been, by such men as the late Professor, trained to look intelligently on nature, and so qualified to put to their designed uses the several parts of the wonderful world which is appointed to be the scene of man's labours.

Having, in common with you all, entertained a very sincere regard for the late Professor Hincks, I could not let slip the opportunity of offering this tribute to his memory, which will long continue green amongst us.

[The late Professor Hincks was the son of the Rev. Dr. Hincks, of Belfast, Professor of Hebrew in the Royal Institution of that city, and brother of the distinguished Oriental Scholar and Archæologist, Dr. Edward Hincks, formerly Fellow of Trinity College, Dublin. On the establishment of a chair of Natural History in Queen's College, Cork, the late Professor received the appointment; and from 1854 he held a similar position in University College, Toronto. He died on Sunday, Sept. 10th, 1871, aged 79. He contributed papers on Botany to the British Association, of which he was an early member, and to the Linnæan Society, of which he was for many years a Fellow. His contributions to the *Canadian Journal of Science, Literature and History* are enumerated above.]

CANADIAN INSTITUTE.

ANNUAL REPORT OF THE COUNCIL FOR THE YEAR 1870–'71.

The Council of the Canadian Institute have the honor to present the following report of the proceedings of the Society for the past year from the 1st December, 1870 to 30th November, 1871.

MEMBERSHIP.

The present state of Membership:

Members at commencement of Session, 1st December, 1870 ..	343	
Members elected during session 1870–71	12	
		355
Deduct.		
Deaths.....	6	
Withdrawn	6	
Left the Province	3	
Non-payment of Subscriptions	6	
		21
		334
Composed of		
Honorary Members.....	5	
Life Members.....	26	
Corresponding Members	5	
Ordinary Members	298	
		334

COMMUNICATIONS.

The following list of papers read at the ordinary meetings held during the Session will be found to contain many valuable communications:

2*nd December*, 1870.—Rev. Prof. Hincks, a Communication on the "Gigantic Trees of California," and T. C. Patteson, Esq., on "The Yosemite Valley."

9*th December*, 1870.—Dr. Temple, a "Case of Ramela" that occurred in his practice.

16*th December*, 1870.—The Annual Report.

13*th January*, 1871.—Rev. Dr. Scadding, Annual Address—"Museums and other Classified Collections, temporary or permanent, as Instruments of Education in Natural Science."

20*th January*, 1871.—Dr. W. Canniff, "A Case of Malignant Disease of the Mouth, occurring in a patient operated upon a year ago by him in the Toronto General Hospital."

27*th January*, 1871.—J. Loudon, M.A., "On Trilinear Co-Ordinates." Dr. D. Wilson, "On the Education of the Hand."

3*rd February*, 1871.—Dr. C. B. Hall, "Biographical Sketches of Eminent Medical Men."

17*th February*, 1871.—Dr. Reeve, "A Case of a Foreign Body in the Orbit."

18*th February*, 1871.—J. Loudon, M.A., "On the Equilibrium of Floating Bodies." Prof. Goldwin Smith, "On Some Points connected with War and Military Affairs in the Time of Edward III."

(To be Continued.)

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

BY THE REV. DR. SCADDING.

XLIV.—YONGE STREET—FROM THE BAY TO QUEEN STREET.

The tourist of the present day, who, on one of our great lake-steamers, enters the harbour of Toronto, observes, as he is borne swiftly along, an interesting succession of street vistas, opening at intervals inland, each one of them somewhat resembling a scene on the stage. He obtains a glimpse for a moment of a thoroughfare gently ascending in a right line northward, with appropriate groups of men and vehicles, reduced prettily to lilliputian size by distance.

Of all the openings thus transiently disclosed, the one towards which the boat at length shapes its course, with the clear intention of thereabout disburdening itself of its multifarious load, is quickly seen to be of preëminent importance. Thronged at the point where it descends to the water's edge with steamers and other craft, great and small, lined on the right and left up to the far vanishing-point with handsome buildings, its pavements and central roadway everywhere astir with life, its appearance is agreeably exciting and even impressive. It looks to be, what in fact it is, the outlet of a great highway leading into the interior of a busy populous country. The railway station seen on the right, heaving up its huge semicircular metal back above the subjacent buildings, and flanking the very sidewalk with its fine front and lofty ever-open portals, might be imagined a porter's lodge proportioned to the dignity of the avenue whose entrance it seems planted there to guard.

We propose to pass, as rapidly as we may, up the remarkable street at the foot of which our tourist steps ashore. It will not be a part of our plan to enlarge on its condition as we see it at the present time, except here and there as in contrast with some circumstance of the past. We intend simply to take note, as we ramble on, of such recollections as may spring up at particular points, suggested by objects or localities encountered, and to recall at least the names, if not in every instance, characteristic traits and words and acts of some of the worthies of a byegone generation, to whose toil and endurance the present occupants of the region which we shall traverse are so profoundly indebted.

Where Yonge Street opened on the harbour, the observer some forty years ago would only have seen, on the east side, the garden, orchard and pleasure grounds of Chief Justice Scott, with his residence situated therein, afterwards the abode of Mr. Justice Sherwood; and on the west side the garden, orchard, pleasure-grounds and house of Mr Justice Macaulay, afterwards Chief Justice Sir James Macaulay, and the approaches to these premises were, in both cases, not from Yonge Street but from Front Street, or from Market Street in the rear.

The principal landing place for the town was for a series of years, as we have elsewhere stated, at the southern extremity of Church Street; and then previously, for another series of years, further to the east, at the southern extremity of Frederick Street. The country and local traffic found its way to these points, not by Yonge Street south of King Street, but by other routes which have been already specified and described.

Teams and solitary horses, led or ridden, seen passing into Yonge Street, south of King street, either out of King Street or out of Front Street, would most likely be on their way to the forge of old Mr. Philip Klinger, a German whose name we used to think had in it a kind of anvil ring. His smithy, on the east side, just south of Market Street, now Wellington Street, was almost the only attraction and occasion of resort to Yonge Street south of King Street.

His successor here was Mr. Calvin Davis, whose name became as familiar a sound to the ears of the early townsfolk of York as Mr. Klinger's had been.

It seems in the retrospect but a very short time since Yonge Street south of King Street, now so solidly and even splendidly built up, was an obscure allowance for road, visited seldom by any one, and for a long while particularly difficult to traverse during and just after the rainy seasons.

Few persons in the olden time at which we are glancing ever dreamed that the intersection of Yonge Street and King Street was to be the heart of the town. Yet here in one generation we have the Carfax of Toronto, as some of our forefathers would have called it—the Quatrevoies, or Grand Four-cross-way, where the golden milestone might be planted whence to measure distances in each direction.

What are the local mutations that are to follow? Will the needs of the population and the exigencies of business ever make of the intersection of Brock Street and Queen Street what the intersection of Yonge and King Street is now?

In the meantime, those who recall the very commonplace look which this particular spot, viz., the intersection of King Street and Yonge Street long wore, when as yet only recently reclaimed from nature, cannot but experience a degree of mental amazement whenever now they pause for a moment on one of the crossings and look around.

A more perfect and well-proportioned rectangular meeting of four great streets is seldom to be seen. Take the view at this point, north, south, west, or east, almost at any hour and at any season of the year, and it is striking.

It is striking in the freshness and coolness and comparative quiet of early morning, when few are astir.

It is striking in the brightness and glow of noon, when the sons and daughters of honest toil are trooping in haste to their mid-day meal.

A few hours later, again, it is striking when the phaetons, pony-carriages, and fancy equipages generally, are out, and loungers of each sex are leisurely promenading, or here and there placidly engaged in the inspection and occasional selection of "personal requisites," of some one or other of the variegated tissues or artificial adjuncts demanded by the modes of the period, while the westering sun is now flooding the principal thoroughfare with a misty splendour, and on the walls, along on either side, weird shadows slanting and elongated, are being cast.

Then, later still, the views here are by no means ordinary ones, when the vehicles have for the most part withdrawn, and the passengers are once more few in number, and the lamps are lighted, and the gas is flaming in the windows.

Even in the closed-up sedate aspect of all places of business on a Sunday or public holiday, statutable or otherwise, these four streets, by some happy charm, are fair to see and cheery. But when drest for a festive gala occasion, when gay with banners and festoons, in honour of a royal birth-day, a royal marriage, the visit of a prince, the announcement of a victory, they shew to special advantage.

So, also, they furnish no inharmonious framework or setting, when processions and bands of music are going by, or bodies of military, horse or foot, or pageants such as those that in modern times accompany a great menagerie in its progress through the country—elephants in oriental trappings, teams of camels clad in similar guise, cavaliers in glittering mediæval armour, gorgeous cars and vans.

And again, in winter, peculiarly fine pictures, characteristic of the season, are presented here when, after a plentiful fall of snow, the sleighs are on the move without number and in infinite variety; or when, on the contrary, each long white vista, east, west, north, and south, glistening, perhaps, under a clear December moon, is a scene almost wholly of still life—scarcely a man or beast abroad, so keen is the motionless air, the mercury having shrunk down some way below the zero-line of Fahrenheit.

But we must proceed. From the Lake to the Landing is a long journey.

In the course of our perambulations we have already noticed some instances in the town of long persistency in one place of business or residence. Such evidences of staidness and substantiality are common enough in the old world, but are of necessity somewhat rare amid the chances, changes, and exchanges of young communities on this continent. An additiona

instance we have to note here, at the intersection of King Street and Yonge Street. At its north-east angle, where, as in a former section we have observed, stood the sole building in this quarter, the house of Mr. John Dennis, for forty years at least has been seen with little alteration of external aspect, the Birmingham, Sheffield, and Wolverhampton warehouse of the brothers Mr. Joseph Ridout and Mr. Percival Ridout. A little way to the north, too, on the east side, the name of Piper has been for an equal length of time associated uninterruptedly with a particular business; but here, though outward appearances have remained to some extent the same, death has wrought changes. Near by, also, we see foundries still in operation where Messrs. W. B. Sheldon, F. R. Dutcher, W. A. Dutcher, Samuel Andrus, J. Vannorman and B. Vannorman, names familiar to all old inhabitants, were among the foremost in that kind of useful enterprise in York. Their advertisement, as showing the condition of one branch of the iron manufacture in York in 1832, will be of interest. Some of the articles enumerated have become old-fashioned. "They respectfully inform their friends and the public that they have lately made large additions to their establishments. They have enlarged their Furnace so as to enable them to make Castings of any size or weight used in this province, and erected Lathes for turning and finishing the same. They have also erected a Steam Engine of ten-horse power, of their own manufacture, for propelling their machinery, which is now in complete operation, and they are prepared to build Steam Engines of any size, either high or low pressure. Having a number of experienced engineers employed, whose capability cannot be doubted, they hope to share the patronage of a generous public. They always keep constantly on hand and for sale, either by wholesale or retail, Bark Mills, Cooking, Franklin, Plate, and Box Stoves, also, a general assortment of Hollow Ware, consisting of: Kettles, from one to one hundred and twenty gallons; Bake-Ovens, Bake-Basins, Belly-Pots, High Pans, Tea-Kettles, Wash-Kettles, Portable Furnaces, &c. Also are constantly manufacturing Mill-Gearing of all kinds; Sleigh Shoes, 50, 56, 30, 28, 15, 14, and 7 pound weights, Clock and Sash Weights, Cranes, Andirons, Cart and Waggon Boxes, Clothiers' Plates, Plough Castings, and Ploughs of all kinds." In 1832 Mr. Charles Perry was also the proprietor of foundries in York, and we have him advertising in the local paper that "he is about adding to his establishment the manufacture of Printing Presses, and that he will be able in a few weeks to produce Iron Printing Presses combining the latest improvements,"

We move on now towards Newgate Street, first noticing that nearly opposite to the Messrs. Sheldon and Dutcher's foundry were the spirit vaults of Mr. Michael Kane, father of Paul Kane, the artist of whom we have spoken previously. At the corner of Newgate Street is Adelaide Street, on the left, and stretching along the southern side of that street, the famous tannery-yard of Mr. Jesse Ketchum was to be seen, with high stacks of hemlock-bark piled up on the Yonge Street side. On the north side of Newgate Street, at the angle opposite, was his residence, a large white building in the American style, with a square turret, bearing a railing, rising out of the ridge of the roof. Before pavements of any kind were introduced in York, the sidewalks hereabout were rendered clean and comfortable by a thick coating of tan-bark. Mr. Ketchum emigrated hither from Buffalo at an early period. In 1806 we find him named at the annual "town meeting," one of the overseers of highways and fence viewers. His section was from "No. 1 to half the Big Creek Bridge [Hogg's Hollow] on Yonge Street." Mr. Wm. Marsh, jun., then took up the oversight from half the Big Creek Bridge to No. 17. He came over in the first instance to look after the affairs of an elder brother, deceased, who had settled here and founded the tannery works. Jesse then continued to be a householder of York until about 1845, when he returned to Buffalo, his original home, where he still retained valuable possessions. He was familiarly known in Buffalo in later years as "Father Ketchum," and was distinguished for the lively practical interest which he took in schools for the young, and for the largeness of his annual contributions to such institutions. Two brothers, Henry and Zebulun, were also early inhabitants of Buffalo. Mr. Ketchum's York property extended to Lot Street. Hospital Street (Richmond Street) passed through it, and he himself projected and opened Temperance Street. To the facility with which he supplied building sites for moral and religious uses it is due that at this day the quadrilateral between Queen Street and Adelaide Street, Yonge Street and Bay Street, is a sort of miniature Mount Athos, a district curiously crowded with places of worship. He gave in Yorkville also sites for a school-house and temperance hall, and, besides, two acres for a Childrens' Park. The Bible and Tract Society likewise obtained its House on

Yonge Street on easy terms from Mr. Ketchum, on the condition that the Society should annually distribute in the Public Schools the amount of the ground rent in the form of books—a condition that continues to be punctually fulfilled. The ground-rent of an adjoining tenement was also secured to the Society by Mr. Ketchum, to be distributed in Sunday Schools in a similar way. Thus by his generous gifts and arrangements in Buffalo, and in our own town and neighbourhood, his name has become permanently enrolled in the list of public benefactors in two cities. Among the subscriptions to a "Common School" in York in 1820, a novelty at the period, we observe his name down for one hundred dollars. Subscriptions of that amount to any object were not frequent in York in 1820. (Among the contributors to the same school we observe Jordan Post's name down for £17 6*s.* 3*d.*; Philip Klinger's for £2 10*s.*; Lardner Bostwick's for £2 10*s.*) Mr. Ketchum died in Buffalo in 1867. He was a man of quiet, shrewd, homely appearance and manners, and of the average stature. His brother Seneca was also a character well known in these parts for his natural benevolence, and likewise for his desire to offer counsel to the young on every occasion. We have a distinct recollection of being, along with several young friends, the objects of a well-intended didactic lecture from Seneca Ketchum, who, as we were amusing ourselves on the ice, approached us on horseback.

It seems singular to us, in the present day, that those who laid out the region called the "New Town," that is, the land westward of the original town-plot of York, did not apparently expect the great northern road known as Yonge Street ever to extend directly to the water's edge. In the plans of 1800, Yonge Street stops short at Lot Street, *i. e.*, Queen Street. A range of lots blocks the way immediately to the south. The traffic from the north was expected to pass down into the town by a thoroughfare called Toronto Street, three chains and seven links to the east of the line of Yonge Street. Mr. Ketchum's lot, and all the similar lots southward, were bounded on the east by this street. The advisability of pushing Yonge Street through to its natural terminus must have early struck the owners of the properties that formed the obstruction. We accordingly find Yonge Street in due time "produced" to the Bay. Toronto Street was then shut up, and the proprietors of the land through which the northern road now ran received in exchange for the space usurped proportionate pieces of the old Toronto Street. In 1818 deeds for these fragments, executed in conformity with the ninth section of an Act of the local Parliament, passed in the fiftieth year of George III., were given to Jesse Ketchum, William Bowkett, mariner, son of William Bowkett, and others, by the surveyors of highways, James Miles for the Home District, and William Richardson Caldwell for the County of York, respectively.

The street which supplied the passage-way southward previously afforded by Toronto Street, and which now formed the easterly boundary of the easterly portions of the lots cut in two by Yonge Street, was, as we have had occasion already to state in another place, called Upper George Street, and afterwards Victoria Street.

(The line of the now-vanished Toronto Street is, for purposes of reference, marked with fine lines on the map of Toronto by the Messrs. H. J. and J. O. Browne.)

What the condition of some of the lots to which we have been just referring was in 1801 we gather from a surveyor's report of that date. The Government had issued an order to examine how far the settlement duties had been fulfilled by the occupants of lots in this locality. As a result of this order we have a "Sketch of the Part of the Town of York, west of Toronto Street," consisting of a collection of squares, some blank, some coloured blue, some coloured black, to which the following explanation is attached: "The blank lots are cleared agreeable to the notice issued from his Excellency the Lieutenant-Governor, bearing date September the fourth, 1800. The lots shaded blue are chiefly cut, but the brush not burnt; and those marked with the letter A, the brush only cut. The lots shaded black, no work done. This survey made by order of the Surveyor-General's office, bearing date April the 23rd, 1801." The report was held to be not sufficiently complete and explicit. Another was demanded. The explanation of the chequers in the second sketch is as follows: 1st. The blank lots are cleared. 2nd. The lots shaded black, no work done. 3rd. The lots shaded brown, the brush cut and burnt. 4th. The lots shaded blue, the brush cut and not burnt. N. B. The lots 1 and 2 on the north side of Newgate Street [these are Mr. Ketchum's lots], are mostly clear of the large timber, and some brush cut also, but not burnt; therefore omitted in the first Report. This second examination done by order of the Honourable John Elmsley, Esq., and performed by (the name is

gone, but it was that of Mr. John Stegman, a well-known early Deputy Provincial Surveyor, of whom we shall hear again). In 1800 the following order had been issued to him by the acting Surveyor-General, D. W. Smith: "S. G. O., 19th Dec., 1800. Mr. John Stegman: Sir,—All persons claiming to hold land in the town of York, having been required to cut and burn all the brush and underwood on the said lots, and to fall all the trees which are standing thereon, you will be pleased to report to me, without delay, the number of the particular lots on which it has not been done. D. W. Smith, A. S. G." The sketches of "the part of the Town of York, west of Toronto Street," just described, were doubtless prepared by Mr. John Stegman, in obedience to this order from the Surveyor-General's office.

The continuation of the great northern highway in a continuous right line to the Bay from its point of issue on Lot Street, *i. e.*, Queen Street, was the circumstance that eventually created for Yonge Street, regarded as a street in the usual sense, the peculiar renown which it popularly has for extraordinary length. A story is told of a tourist, newly arrived at York, wishing to utilize a stroll before breakfast by making out as he went along the whereabouts of a gentleman to whom he had a letter. Passing down the hall of his hotel, he asks in a casual way of the book-keeper—"Can you tell me where Mr. So-and-so lives? (leisurely producing the note from his breast-pocket wallet). It is somewhere along Yonge Street here in your town." "Oh yes," was the reply, when the address had been glanced at—"Mr. So-and-so lives on Yonge Street, about twenty-five miles up!" We have heard also of a serious demur on the part of a Quebec naval and military inspector, at two agents for purchases being stationed on one street at York. However surprised, he was nevertheless satisfied when he learned that their posts were thirty miles apart. Let us now direct our attention to Yonge Street north of Queen Street.

XLV.—YONGE STREET—FROM QUEEN STREET TO CARLETON STREET.

For some years previous to the opening of Yonge Street from Lot Street to the Bay, the portion of the great highway to the north, between Lot Street and the road which is now the southern boundary of Yorkville, was in an almost impracticable condition. The route was recognized, but no grading or causewaying had been done on it. In the popular mind, indeed, practically, the point where Yonge Street began as a travelled road to the north, was at Yorkville, as we should now speak. The track followed by the farmers coming into town from the north veered off at Yorkville to the eastward, and passed down in a haphazard kind of way over the sandy pineland in that direction, and finally entered the town by the route later known as Parliament Street. In 1800 the expediency was seen of making the direct northern approach to York more available. In the *Gazette* of Dec. 20th, 1800, we have an account of a public meeting held on the subject. It will be observed that Yonge Street, between Queen Street and Yorkville, as moderns would phrase it, is spoken of therein, for the moment, not as Yonge Street, but as "the road to Yonge Street." "On Thursday last, about noon," the *Gazette* reports, "a number of the principal inhabitants of this town met together in one of the Government Buildings, to consider the best means of opening the road to Yonge Street, and enabling the farmers there to bring their provisions to market with more ease than is practicable at present." The account then proceeds: "The Hon. Chief-Justice Elmsley was called to the chair. He briefly stated the purpose of the meeting, and added that a subscription-list had been lately opened by which something more than two hundred dollars in money and labour had been promised, and that other sums were to be expected from several respectable inhabitants who were well-wishers to the undertaking, but had not as yet contributed towards it. These sums, he feared, however, would not be equal to the purpose, which hardly could be accomplished for less than between five and six hundred dollars. Many of the subscribers were desirous that what was already subscribed should be immediately applied as far as it would go, and that other resources should be looked for. A paper was produced and read containing a proposal from Mr. Eliphalet Hale to open and make the road, or so much of it, as might be required, at the rate of twelve dollars per acre for clearing it where no causeway was wanted, four rods wide, and cutting the stumps in the two middle rods close to the ground; and seven shillings and sixpence, provincial currency, per rod, for making a causeway eighteen feet wide where a causeway might be wanted. Mr. Hale undertook to find security for the due performance of the work by the first of Febru-

ary following (1801). The subscribers present were unanimously of opinion that the subscription should be immediately applied as far as it would go. Mr. Hale's proposition was accepted, and a committee consisting of Mr. Secretary Jarvis, Mr. William Allan, and Mr. James Playter, was appointed to superintend the carrying of it into execution. Additional subscriptions would be received by Messrs. Allan and Wood." At the same meeting a curious project was mooted, and a resolution in its favour adopted, for the permanent shutting up of a portion of Lot Street, and selling the land, the proceeds to be applied to the improvement of Yonge Street. There was no need of that portion of Lot Street, it was argued, there being already convenient access to the town in that direction by a way a few yards to the south. We gather from this that Hospital Street [Richmond Street] was the usual beaten track into the town from the west. "It had been suggested," says the report of the meeting, "that considerable aid might be obtained by shutting up the street which now forms the northern boundary of the town between Toronto Street and the Common, and disposing of the land occupied by it. This street, it was conceived, was altogether superfluous," the report continues, "as another street equally convenient in every respect runs parallel to it at the distance of about ten rods; but it could not be shut up and disposed of by any authority less than that of the Legislature." A petition to the Legislature embodying the above ideas was to lie for signature at Mr. McDougal's Hotel.

The proposed document may have been duly presented, but the Legislature certainly never closed up Lot Street. Owners of park lots westward of Yonge Street may have had their objections. The change suggested would have compelled them to buy not only the land occupied by Lot Street, but also the land immediately to the south of their respective lots; otherwise they would have had no frontage in that direction.

The money collected was, we suppose, satisfactorily laid out by Mr. Hale, but it did not suffice for the completion of the contemplated work. From the *Gazette* of Feb. 20 in the following year (1802), we learn that a second subscription was started for the purpose of completing the communication with the travelled part of Yonge Street to the north. In the *Gazette* just named we have the following, under date of York, Saturday, Feb. 20, 1802: "We whose names are hereunto subscribed, contemplating the advantage which must arise from the rendering of Yonge Street accessible and convenient to the public, and having before us a proposal for completing that part of the said street between the Town of York and lot No. 1, do hereby respectively agree to pay the sums annexed to our names towards the carrying of the said proposal into effect; cherishing at the same time the hope that every liberal character will give his support to a work which has for its design the improvement of the country, as well as the convenience of the public: *the Chief-Justice, 100 dollars; *Receiver-General, $20; *Robt. J. D. Grey, $20 (and two acres of land when the road is completed); John Cameron, $40; *Jas. Macaulay, $20; *Alexander Wood, $20; *William Weekes, $20; John McGill, $16; Wilson, Humphreys and Campbell, $15; D. W. Smith, $10; Thomas Scott, $10; *Wm. Jarvis, $10; *John Small, $10; *David Burns, $10; *Wm. Allan, $10; Alex. McDonell, $10; Wm. Smith, $10; Robert Henderson, $10; *Simon McNabb, $8; John McDougal, $8; D. Cozens, $8; Thomas Ward, $8; *Elisha Beaman, $6; Jos. Hunt, $6; Eli Playter, $6; John Bennett, $6; *George Cutter, $6; James Norris, $5½; Wm. B. Peters, $5; John Leach, $5; John Titus, $5; Wm. Cooper, $5; *Wm. Hunter, $5; J. B. Cozens, $5; *Daniel Tiers, $5; Thomas Forfar, $5; Samuel Nash, $5; Paul Marian, $3; Thomas Smith, $3; John McBeath, $3." It is subjoined that "subscriptions will be received by Mr. S. McNabb, Secretary, and advertised weekly in the *Gazette*. Those marked thus (*) have paid a former subscription."

In the *Gazette* of March 6, 1802, an editorial is devoted to the subject of the improvement of Yonge Street. It runs as follows: "It affords us much pleasure to state to our readers that the necessary repair of Yonge Street is likely to be soon effected, as the work, we understand, has been undertaken with the assurance of entering upon and completing it without delay; and by every one who reflects upon the present sufferings of our industrious community on resorting to a market, it cannot but prove highly satisfactory to observe a work of such convenience and utility speedily accomplished. That the measure of its future benefits must be extreme indeed, we may reasonably expect; but whilst we look forward with flattering expectations of these benefits, we cannot but appreciate the immediate advantage which is afforded to us, in being relieved from the application of the statute labour to circuitous bye-paths and

occasional roads, and in being enabled to apply the same to the improvement of the streets, and the nearer and more direct approaches to the Town." The irregular track branching off eastward at Yorkville was an example of these "circuitous byepaths and occasional roads." Editorials were rare at the period. Had there been more of them, subsequent investigators would have been better able than they are, to reproduce pictures of the olden time. Chief-Justice Elmsley was possibly the inspirer of the *Gazette* in the present instance The meagreness and incompleteness of the record of local affairs in the official paper are often tantalizing.

The work appears to have been duly proceeded with. In the following June, we have an advertisement calling a meeting of the committee entrusted with its superintendence. In the *Gazette* of June 12, 1802, we read: "The committee for inspecting the repair of Yonge Street requests that the subscribers will meet on the repaired part of said street at 5 o'clock on Monday evening, to take into consideration how far the moneys subscribed by them have been beneficially expended. S. McNabb, Secretary to Committee. York, 10th June, 1802."

These early efforts of our predecessors to render practicable the great northern approach to the town, are deserving of respectful remembrance.

The nature of the soil at many points between Lot Street and the modern Yorkville was such as to render the construction of a road that should be comfortably practicable at all seasons of the year no easy task. Down to the time when macadam was at length applied, some twenty-eight years after Mr. Hale's operations, this approach to the town was notorious for its badness every spring and autumn. At one period an experiment was tried of a wooden tramway for a short distance at the worst part, on which the loaded waggons were expected to keep and so be saved from sinking hopelessly in the direful sloughs. Mr. Sheriff Jarvis was the chief promoter of this improvement, which answered its purpose for a time, and Mr. Rowland Burr was its suggester. But we must not forestall ourselves.

We return to the point where Lot Street, or Queen Street, intersects the thoroughfare which we are about to traverse.

After passing Mr. Jesse Ketchum's property, which had been divided into two parts by the pushing of Yonge Street southward to its natural termination, we arrived at another striking rectangular meeting of thoroughfares. Lot Street having happily escaped extinction westward and eastward, there was created at this spot a four-cross-way possessed of an especial historic interest, being the conspicuous intersection of the two great military roads of Upper Canada, projected and explored in person by its first organiser. Four extensive reaches, two of Dundas Street (identical, of course, with Lot or Queen Street), and two of Yonge Street, can here be contemplated from one and the same standpoint. In the course of time the views up and down the four long vistas here commanded will probably rival those to be seen at the present moment where King Street crosses Yonge Street. When lined along all its sides with handsome buildings, the superior elevation above the level of the Lake of the more northerly quadrivium will be in its favour.

Perhaps it will here not be out of order to state that Yonge Street was so named in honour of Sir George Yonge, Secretary of War in 1791. The first exploration which led to the establishment of this communication with the north, was made in 1793. On the early MS. map mentioned before in these papers, the route taken by Governor Simcoe on the memorable occasion, in going and returning, is shewn. Explanatory of the red dotted lines which indicate it, the following note is appended. It reveals the Governor's clear perception of the commercial and military importance of the projected road: "Lieut.-Gov. Simcoe's route on foot and in canoes to explore a way which might afford communication for the Fur-traders to the Grand Portage, without passing Detroit in case that place were given up to the United States. The march was attended with some difficulties, but was quite satisfactory: an excellent harbour at Penetanguishene: returned to York 1793."

(On the same map, the tracks are given of four other similar excursions, with the following accounts appended respectively: 1. Lieut.-Gov. Simcoe's route on foot from Niagara to Detroit and back again in five weeks; returned to Niagara March 8th, 1793. 2. Lieut.-Gov. Simcoe's route from York to the Thames; down that river in canoes to Detroit; from thence to the Miamis to build the fort Lord Dorchester ordered to be built: left York March 17th, 1794; returned by Lake Erie and Niagara to York May 5th, 1794. 3. Lieut.-Gov. Simcoe's track from York to Kingston in an open boat, Dec. 5th, 1794. 4. Lieut.-Gov. Simcoe's route from Niagara

to Long Point on Lake Erie, on foot and in boats: returned down the Ouse [Grand River]: from thence crossed a portage of five miles to Welland River, and so to Fort Chippewa, September, 1795.)

The old chroniclers of England speak in high praise of a primeval but somewhat mythic king of Britain, named Belin:

"Belin well held his honour,
And wisely was good governour,"

says Peter de Langtoft, and his translator, Robert de Brunne; and they assign, among the reasons why he merited such mention at their hands, the following:

"His land Britaine he yode throughout,
And ilk county beheld about;
Beheld the woods, water and fen.
No passage was maked for men,
No highe street thorough countrie,
Ne to borough ne citié.
Thorough mooris, hills and valleys
He madé brigs and causeways,
Highe street for common passage,
Brigs over water did he stage."

This notice of the old chroniclers' pioneer king of Britain has again and again recurred to us as we have had occasion to narrate the energetic doings of the first ruler of Upper Canada, here and previously. What Britain was when Belin and his Celts were at work, Canada was in the days of our immediate fathers—a trackless wild. That we see our country such as it is to-day, approaching in many respects the beauty and agricultural finish of Britain itself, is due to the intrepid men who faced without blenching the trials and perils inevitable in a first attack on the savage fastnesses of nature.

A succinct but good account is given of the origin of Yonge Street in Mr. Surveyor Genera; D. W. Smith's Gazetteer of 1799. The advantages expected to accrue from the new highway are clearly set forth; and though the anticipations expressed have not been fulfilled precisely in the manner supposed, we see how comprehensive and really well-laid were the plans of the first organizer of Upper Canada.

"Yonge Street," the early Gazetteer says, "is the direct communication from York to Lake Simcoe, opened during the administration of his Excellency Major-General Lieutenant Governor Simcoe, who, having visited Lake Huron by Lake aux Claies (formerly also Ouentaronk, or Sinion, and now named Lake Simcoe), and discovered the harbour of Penetanguishene (now Gloucester) to be fit for shipping, resolved on improving the communication from Lake Ontario to Lake Huron, by this short route, thereby avoiding the circuitous passage of Lake Erie. This street has been opened in a direct line, and the road made by the troops of his Excellency's corps. It is thirty miles from York to Holland's river, at the Pine Fort called Gwillimbury, where the road ends; from thence you descend into Lake Simcoe, and, having passed it, there are two passages into Lake Huron; the one by the river Severn, which conveys the waters of Lake Simcoe into Gloucester Bay; the other by a small portage, the continuation of Yonge Street, to a small lake, which also runs into Gloucester Bay. This communication affords many advantages; merchandize from Montreal to Michilimackinac may be sent this way at ten or fifteen pounds less expense per ton, than by the route of the Grand or Ottawa River; and the merchandize from New York, to be sent up the North and Mohawk Rivers for the north-west trade, finding its way into Lake Ontario at Oswego (Fort Ontario), the advantage will certainly be felt of transporting goods from Oswego to York, and from thence across Yonge Street, and down the waters of lake Simcoe into lake Huron, in preference to sending it by lake Erie."

We now again endeavour to effect a start on our pilgrimage of retrospection up the long route, from the establishment of which so many public advantages were predicted in 1799.

The objects that came to be familiar to the eye at the entrance to Yonge Street from Lot Street were, after the lapse of some years, on the west side, a large square white edifice known as the Sun Tavern, Elliott's; and on the east side, the buildings constituting Good's Foundry.

The open land to the north of Elliott's was the place generally occupied by the travelling menageries and circuses when such exhibitions began to visit the town.

The foundry, after supplying the country for a series of years with ploughs, stoves and other useful and necessary articles of heavy hardware, is memorable as having been the first in Upper Canada to turn out real railway locomotives. When novelties, these highly finished ponderous machines, seen slowly and very laboriously urged through the streets from the foundry to their destination, were startling phenomena. We have in the *Canadian Journal* (vol. ii. p. 76), an account of the first engine manufactured by Mr Good from the Toronto Locomotive Works, with a lithographic illustration. "We have much pleasure," the editor of the *Canadian Journal* says, "in presenting our readers with a drawing of the first locomotive engine constructed in Canada, and indeed, we believe, in any British Colony. The 'Toronto' is certainly no beauty, nor is she distinguished for any peculiarity in the construction, but she affords a very striking illustration of our progress in the mechanical arts, and of the growing wants of the country. The 'Toronto' was built at the Toronto Locomotive Works, which were established by Mr. Good, in October, 1852. The order for the 'Toronto' was received in February, 1853, for the Ontario, Simcoe and Huron Railroad. The engine was completed on the 16th of April, and put on the track the 26th of the same month. Her dimensions are as follows: cylinder 16 inches diameter, stroke 22 inches, driving wheel 5 feet 6 inches diameter, length of internal fire box 4 feet 6 inches, weight of engine 25 tons, number of tubes 150, diameter of tubes 2 inches."

With property a little to the north on the east side, the name of McIntosh was early associated, and—Canadian persistency again—is still associated. Of Captains John, Robert and Charles McIntosh, we shall have occasion to speak in our paper on the early Marine of York harbour. It was opposite the residence of Capt. John McIntosh that the small riot took place, which signalized the return home of William Lyon Mackenzie, in 1849, after the civil tumults of 1837. Mr. Mackenzie was at the time the guest of Captain McIntosh, who was related to him through a marriage connexion.

Albert Street, which enters Yonge Street opposite the McIntosh property, was in 1833 stil known as Macaulay Lane, and was described by Walton as "fronting the Fields." From this point a long stretch of fine forest-land extended to Yorkville. On the left side it was the property partly of Dr. Macaulay and partly of Chief Justice Elmsley. The fields which Macaulay Lane fronted were the improvements around Dr. Macaulay's abode. The white entrance gate to his house was near where now a street leads into Trinity Square. Wykham Lodge, the residence of Sir James Macaulay after the removal from Front Street, and Elmsley Villa, the residence of Captain J. S. Macaulay, (Government House in Lord Elgin's day, and subsequently Knox College,) were late erections on portions of these spacious suburban estates.

At first Dr. Macaulay and Chief Justice Elmsley selected two adjoining park lots, both of them fronting, of course, on Lot Street. They then effected an exchange of properties with each other. Dividing these two lots transversely into equal portions, the Chief Justice chose the upper or northern halves, and Dr. Macaulay the lower or southern. Dr. Macaulay thus acquired a large frontage on Lot Street, and the Chief Justice a like advantage on Yonge Street. Captain Macaulay acquired his interest in the southern portion of the Elmsley halves by marriage with a daughter of the Chief Justice. The northern portion of these halves descended to the heir of the Chief Justice, Capt. John Elmsley, who having become a convert to the Church of Rome, gave facilities for the establishment of St. Basil's college and other Roman Catholic institutions on his estate. Of Ch. Jus. Elmsley and his son we have previously spoken. [See sections v., ix. and xxxv.]

Dr. Macaulay's clearing on the north side of Macaulay lane was, in relation to the first town plot of York, long considered a locality particularly remote ; a spot to be discovered by strangers not without difficulty. In attempting to reach it we have distinct accounts of persons bewildered and lost for long hours in the intervening marshes and woods. Mr. Justice Boulton, travelling from Prescott in his own vehicle, and bound for Dr. Macaulay's domicile, was dissuaded, on reaching Mr. Small's house at the eastern extremity of York, from attempting to push on to his destination, although it was by no means late, on account of the inconveniences and perils to be encountered ; and half of the following day was taken up in accomplishing the residue of the journey. Dr. Macaulay's cottage might still have been existent and in good order ; but while it was being removed bodily by Mr. Alexander Hamilton, from its original site

to a position on the entrance of Trinity Square, a few yards to the eastward, it was burnt, either accidentally or by the act of an incendiary. Mr. Hamilton, who was intending to convert the building into a home for himself and his family, gave the name of Teraulay Cottage—the name by which the destroyed building had been known—to the house for himself which he put up in its stead.

A quarter of a century sufficed to transform Dr. Macaulay's garden and grounds into a well-peopled city district. The "fields," of which Walton spoke, have undergone the change which St. George's Fields and other similar spaces have undergone in London:

St. George's Fields are fields no more;
The trowel supersedes the plough;
Huge inundated swamps of yore
Are changed to civic villas now.
The builder's plank, the mason's hod,
Wide and more wide extending still,
Usurp the violated sod.

The area which Dr. Macaulay's homestead immediately occupied now constitutes Trinity Square—a little bay by the side of a great stream of busy human traffic, ever ebbing and flowing, not without rumble and other resonances; a quiet close, resembling, it is pleasant to think, one of the Inns of Court in London, so tranquil despite the turmoil of Fleet Street adjoining. Trinity Square is now completely surrounded with buildings, nevertheless an aspiring attic therein, in which many of these collections and recollections have been reduced to shape, has the advantage of commanding to this day a view still showing within its range some of the primitive features of the site of York. To the north an extended portion of the rising land above Yorkville is pleasantly visible, looking in the distance as it anciently looked, albeit beheld now with spires intervening, and ornamental turrets of public buildings, and lofty factory flues: while to the south, seen also between chimney stacks and steeples and long solid architectural ranges, a glimpse of lake Ontario itself is procurable—a glimpse especially precious so long as it is to be had, for not only recalling, as it does, the olden time when "the Lake" was an element in so much of the talk of the early settlers—its sound, its aspect, its condition being matters of hourly observation to them—but also suggesting the thought of the far-off outer ocean-stream—the silver moat that guards the fatherland, and that forms the horizon in so many of its landscapes. To the far-off Atlantic, and to the misty isles beyond—the true *Insulæ Fortunatæ*—we need not name them—the glittering slip which we are still permitted to see yonder is the highway—the route by which the fathers came—the route by which their sons from time to time return to make dutiful visits to hearthstones and shrines never to be thought of or named without affection and reverence. Of that other ideal ocean-stream too, and of that other ideal home, of which the poet speaks, our peep of Ontario may likewise to the thoughtful be an allegory, by the help of which

In a season of calm weather,
Though inland far we be,
Our souls have sight of that immortal sea
Which brought us hither;
Can in a moment travel thither—
And see the children sport upon the shore,
And hear the mighty waters rolling evermore!

XLVI.—YONGE STREET—FROM CARLETON STREET TO YORKVILLE.

In the grove which surrounded Sir James Macaulay's residence, Wykham Lodge, we had down to recent years a fragment of the fine forest which lined Yonge Street, almost continuously from Lot Street to Yorkville, some forty years since. The ruthless uprooting of the eastern border of this beautiful sylvan relic of the past, for building purposes, was painful to witness, however quickly the presence of rows of useful structures reconciled us to the change. The trees which cluster round the great school building in the rear of these improvements will long, as we hope, survive to give an idea of what was the primeval aspect of the whole of the neighbourhood.

The land on the opposite side, a little to the north of the point at which we have arrived, viz., Carleton Street—long remaining in an uncultivated condition, was a portion of the estate of Mr. Alexander Wood, of whom we have already spoken. His family and baptismal names are preserved, as we have before noted, in "Wood" Street and "Alexander" Street.

The streets which we passed southward of Wood Street, Carleton, Gerrard, Shuter, with Gould Street in the immediate vicinity, had their names from personal friends of Mr. McGill, the first owner, as we have seen, of this tract. They are names mostly associated with the early annals of Montreal, and seemed rather inapposite here.

Northward, a little beyond where Grosvenor Street leads into what was Elmsley villa, and is now Knox College, was a solitary green field with a screen of lofty trees on three of its sides. In its midst was a Dutch barn, or hay-barrack, with moveable top. The sward on the northern side of the building was ever eyed by the passer-by with a degree of awe. It was the exact spot where a fatal duel had been fought. We have seen in repeated instances that the so-called code of honour was in force at York from the era of its foundation. "Without it," Mandeville had said, "there would be no living in a populous nation. It is the tie of society; and although we are beholders of our frailties for the chief ingredient of it, there has been no virtue, at least that I am acquainted with, which has proved half so instrumental to the civilizing of mankind, who, in great societies, would soon degenerate into cruel villains and treacherous slaves, were honour to be removed from among them." Mandeville's sophistical dictum was blindly accepted, and trifles light as air gave rise to the conventional hostile meeting. The merest accident at a dance, a look, a jest, a few words of unconsidered talk, of youthful chaff, were every now and then sufficient to force persons who previously, perhaps, had been bosom friends, companions from childhood, along with others sometimes, in no wise concerned in the quarrel at first, to put on an unnatural shew of thirst for each other's blood. The victim of the social usage of the day, in the case now referred to, was a youthful son of Surveyor-General Ridout.

Some years after the event, the public attention was drawn afresh to it. The surviving principal in the affair, Mr. Samuel Jarvis, underwent a trial at the time and was acquitted. But the seconds were not arraigned. It happened in 1828, eleven years after the incident (the duel took place July 12, 1817), that Francis Collins, editor of the *Canadian Freeman*, a paper of which we have before spoken, was imprisoned and fined for libel. As an act of retaliation on at least some of those who had promoted the prosecution, which ended in his being thus sentenced, he set himself to work to bring the seconds into court. He succeeded. One of them, Mr. Henry John Boulton, was now Solicitor-General, and the other, Mr. James E. Small, an eminent member of the Bar. All the particulars of the fatal encounter, were once more gone over in the evidence. But the jury did not convict.

Modern society, here and elsewhere, is to be congratulated on the change which has come over its ideas in regard to duelling. Apart from the considerations dictated by morals and religion, common sense, as we suppose, has had its effect in checking the practice. York, in its infancy, was no better and no worse in this respect than other places. It took its cue in this as in some other matters, from very high quarters. The Duke of York, from whom York derived its name, had himself narrowly escaped a bullet from the pistol of Colonel Lennox: "it passed so near to the ear as to discommode the side-curl," the report said: but our Duke's action, or rather inaction, on the occasion helped perhaps to impress on the public mind the irrationality of duelling: he did not return the fire. "He came out," he said, "to give Colonel Lennox satisfaction, and did not mean to fire at him; if Colonel Lennox was not satisfied, he might fire again."

Just to the north of the scene of the fatal duel, which has led to this digression, was the portion of Yonge street where a wooden tramway was once laid down for a short distance; an experiment interesting to be remembered now, as an early foreshadowing of the existing convenient street railway, if not of the great Northern Railway itself. Subterranean springs and quicksands hereabout rendered the primitive roadmaker's occupation no easy one; and previous to the application of macadam, the tramway, while it lasted, was a boon to the farmers after heavy rains.

Mr. Durand's modest cottage and bowery grounds, near here, recall at the present day, an early praiseworthy effort of its owner to establish a local periodical devoted to Literature and

Natural History, in conjunction with an advocacy of the cause of Temperance A diligent attention to his profession as a lawyer did not hinder the editor of the *Literary Gem* from giving some of his leisure time to the observation and study of Nature. We accordingly have in the columns of that periodical numerous notes of the fauna and flora of the surrounding neighbourhood, which for their appreciativeness, simplicity, and minuteness, remind us of the pleasant pages of White's "Natural History of Selborne." The *Gem* appeared in 1851-2, and had an extensive circulation. It was illustrated with good wood cuts, and its motto was "Humanity, Temperance, Progress." The place of its publication, a small white office still to be seen adjoining the cottage which we are now passing, was indicated by a square label suspended at the right-hand side of the door. The father of Mr. Durand was an Englishman of Huguenot descent, who emigrated hither from Abergavenny at a very early period. Having been previously engaged in the East India mercantile service he undertook the importation of East India produce. After reaching Quebec and Montreal in safety, his first consignments, embarked in batteaux, were swallowed up bodily in the rapids of the St. Lawrence. He nevertheless afterwards prospered in his enterprise, and acquired property. The site of the present city of Hamilton was once almost wholly his. The county of Halton returned him to Parliament as its representative; and in 1817 he enjoyed the distinction of being expelled from the House. A Parliament had recently expired. He offered some criticisms on its proceedings in an Address to his late constituents. The new House, which contained many persons who had been members of the former Parliament, was persuaded to vote the Address to the electors of Halton a libel, to exclude its author from the House, and to commit him to prison. His instant re-election by the county of Halton was of course secured. Up to 1812 Mr. Durand, senior, had edited a political journal, moderate and reasonable in tone, entitled the *Bee*, printed, we believe, at Niagara. From his evidence before the celebrated Grievance Committee of 1835, we observe that he was an early advocate of a number of changes, which have since been carried with effect. Mr. Durand, senior, died at Hamilton, in 1836.

Proceeding onward a few yards, we arrived, in former times, at what was popularly called the Sandhill—a moderate rise, showing where, in bygone ages, the lake began to shoal. An object of interest in the woods here, at the top of the rise, on the west side, was the "Indian's Grave," made noticeable to the traveller by a little civilized railing surrounding it. The story connected therewith was this: When the United States forces were landing in 1813, near the Humber Bay, with the intention of attacking the Fort and taking York, one of Major Givins's Indians concealed himself in a tree, and from that position fired into the boats with fatal effect repeatedly. He was soon discovered, and speedily shot. The body was afterwards found, and deposited with respect in a little grave here on the crest of the Sandhill, where an ancient Indian burying-ground had existed, though long abandoned. It would seem that by some means, the scalp of this poor Indian was packed up with the trophies of the capture of York, conveyed by Lieut. Dudley to Washington. From being found in company with the Speaker's Mace on that occasion, the foolish story arose of its having been discovered over the Speaker's chair in the Parliament building that was destroyed. "With the exception," says Ingersoll, in his History of the War of 1812-14, "of the English general's musical snuff-box, which was an object of much interest to some of our officers, and a scalp which Major Forsyth found suspended over the Speaker's chair, we gained but barren honour by the capture of York, of which no permanent possession was taken." Auchinleck, in his History of the same war, very reasonably observes, that "from the expertness of the backwoodsmen in scalping (of which he gives two or three instances), it is not at all unlikely that the scalp in question was that of an unfortunate Indian who was shot while in a tree by the Americans, in their advance on the town." It was rejected with disgust by the authorities at Washington, Ingersoll informs us, and was not allowed to decorate the walls of the War Office there. Colonel W. F. Coffin, in his "1812: The War and its Moral," asserts that a peruke or scratch-wig, found in the Parliament House, was mistaken for a scalp.

Building requirements have at the present day occasioned the almost complete obliteration of the Sandhill. Innumerable loads of the loose silex of which it was composed have been removed. The bones of the Indian brave, and of his forefathers, have been carted away. In a triturated condition, they mingle now, perhaps, in the mortar of many a wall in the vicinity.

A noble race! but they are gone,
With their old forests wide and deep,
And we have built our houses upon
Fields where their generations sleep.
Their fountains slake our thirst at noon,
Upon their fields our harvest waves,
Our lovers woo beneath their moon—
Then let us spare at least their graves!

Vain, however, was the poet's appeal. Even the prosaic proclamations of the civil power had but temporary effect. We quote one of them of the date of Dec. 14, 1797, having for its object the protection of the fishing places and burying grounds of the Mississaga Indians:

"Proclamation. Upper Canada. Whereas, many heavy and grievous complaints have of late been made by the Mississaga Indians, of depredations committed by some of his Majesty's subjects and others upon their fisheries and burial places, and of other annoyances suffered by them by uncivil treatment, in violation of the friendship existing between his Majesty and the Mississaga Indians, as well as in violation of decency and good order: Be it known, therefore, that if any complaint shall hereafter be made of injuries done to the fisheries and to the burial places of the said Indians, or either of them, and the persons can be ascertained who misbehaved himself or themselves in manner aforesaid, such person or persons shall be proceeded against with the utmost severity, and a proper example made of any herein offending. Given under my hand and seal of arms, at York, this fourteenth day of December, in the year of our Lord one thousand seven hundred and ninety-seven, and in the thirty-eighth year of his Majesty's reign. Peter Russell, President, administering the government. By his Honor's command, Alex. Burns, Secretary."

As to the particular ancient burial-plot on the sandhill north of York, however, it may perhaps be conjectured that prior to 1813 the Mississagas had transferred to other resting places the bulk of the relics which had been deposited there.

Off to the eastward of the sandy rise which we are ascending, was one of the early public nurseries of York, Mr. Frank's. Further to the north on the same side, was another, Mr. Adams'. Mr. Adams was a tall, oval-faced, fair-complexioned Scotchman. An establishment of the same kind at York more primitive still, was that of Mr. Bond, of whom we shall have occasion to speak by and by.

Kearsny House, Mr. Proudfoot's, the grounds of which occupy the site of Frank's nursery garden, is a comparatively modern erection, dating from about 1845; an architectural object regarded with no kindly glance by the ultimate holders of shares in the Bank of Upper Canada—an institution which in the infancy of the country had a mission and fulfilled it, but which grievously betrayed those of the second generation who, relying on its traditionary sterling repute, continued to trust it. With Kearsny House, too, is associated the recollection, not only of the president, so long identified with the Bank of Upper Canada, but of the financier, Mr. Cassells, who, as a kind of *deus ex machinâ*, engaged at an annual salary of ten thousand dollars, was expected to retrieve the fortunes of the institution, but in vain, although for a series of years after being pronounced moribund it continued to yield a handsome addition to the income of a number of persons.

Mr Alexander Murray, subsequently of Yorkville, and a merchant of the olden time at York, occupied the residence which preceded Kearsny House, on the Frank property. One desires, in passing, to offer a tribute to the memory of a man of such genuine worth as was Mr. Murray, although the singular unobtrusiveness which characterized him when living seems almost to forbid the act.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JULY, 1871

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6. A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEN.		
					°	°	°	°	°												°							
1	29.638	29.574	29.537	29.5775	57.8	67.7	63.4	64.55	— 1.77	.351	.439	.417	.394	73	64	71	65	N E	S E b S	S W	S 15 E	4.2	4.0	2.8	3.79	5.19	...	...
2	—	.624	—	—	—	76.0	—	—	—	—	.559	—	—	—	62	—	—	calm.	S W	S W	S 63 W	0.0	5.4	2.4	1.29	2.37	...	...
3	.664	.645	.593	.6278	57.2	75.3	63.4	66.62	— 0.08	.404	.402	.333	.382	86	46	57	59	N N W	S	N E b E	E	1.0	7.0	5.0	3.18	5.21	.100	...
4	.402	.270	.422	.3673	59.1	67.4	59.4	62.08	— 4.80	.449	.506	.434	.459	90	76	86	83	E b N	W b S	W b S	S 54 W	9.0	19.2	2.2	3.01	7.29	.415	...
5	.528	.527	.596	.5513	60.5	75.3	66.3	67.65	+ 0.58	.470	.569	.562	.531	89	65	87	79	calm.	S b W	N E	S 17 W	0.0	14.5	0.8	4.72	5.93	...	...
6	.569	.348	.284	.3890	63.7	67.7	67.0	66.62	— 0.63	.504	.490	.608	.541	85	73	91	83	E b N	S E	W b S	S 41 W	1.5	8.2	2.4	2.80	8.13	.455	...
7	.393	.484	.634	.5152	62.7	76.7	60.5	67.60	— 0.23	.426	.331	.408	.376	74	36	77	58	W b N	N W W	N W b W	N 67 W	15.0	24.4	2.0	10.98	11.10	...	...
8	.697	.653	.521	.6135	59.0	80.0	65.9	68.42	+ 0.88	.392	.507	.411	.437	78	50	64	63	calm.	S b E	calm.	S 4 E	0.0	5.0	0.0	2.30	2.37	...	...
9	—	.391	—	—	—	86.8	—	—	—	—	.604	—	—	—	46	—	—	S W	N W	W N W	N 49 W	0.9	21.6	6.5	7.79	8.41	...	...
10	.630	.593	.513	.5630	62.7	69.1	61.6	64.35	— 3.43	.454	.417	.393	.402	79	58	71	66	N E	S E b E	N b E	N 82 E	2.0	6.8	6.0	3.35	4.48	.010	...
11	.471	.395	.401	.4228	60.7	71.0	64.8	65.87	— 2.03	.450	.460	.542	.479	84	60	88	76	calm.	S S E	S S W	S 12 W	0.0	5.6	4.0	2.14	2.37	inap.	...
12	.448	.554	.590	.5363	64.1	82.1	68.1	73.07	+ 5.07	.473	.352	.566	.495	78	31	82	65	S W	N W	calm.	N 76 W	5.0	11.0	0.0	4.23	5.46	...	...
13	.616	.586	.546	.5763	67.0	85.8	72.0	75.40	+ 7.32	.566	.536	.527	.539	85	43	67	64	S S E	S b E	calm.	S 22 E	0.6	5.0	0.0	1.54	3.33	...	...
14	.530	.458	.494	.4850	71.7	81.8	68.8	74.93	+ 6.75	.576	.637	.489	.582	74	58	69	67	W b N	S b W	W N W	N 71 W	3.8	1.8	2.5	2.23	5.50	.015	...
15	.507	.414	.384	.4342	67.0	78.9	72.8	73.80	+ 5.55	.384	.435	.476	.434	58	44	58	53	N b W	S S W	W b S	S 53 W	3.8	12.6	2.5	4.50	5.45	...	...
16	—	.350	—	—	—	71.3	—	—	—	—	.536	—	—	—	70	—	—	N W b W	S E b S	N W b N	N 41 W	1.0	3.0	5.9	1.60	3.60	inap.	...
17	.390	.397	.419	.4092	58.3	71.7	58.3	63.92	— 4.43	.333	.236	.333	.292	68	29	68	51	N W b W	N W	calm.	N 63 W	2.2	13.0	0.0	4.91	5.45	...	...
18	.394	.243	.363	.3273	56.2	77.8	61.6	65.38	— 3.00	.328	.357	.334	.347	72	37	61	56	calm.	S W b S	N W b N	S 65 W	0.0	17.0	2.0	4.39	6.96	inap.	...
19	.360	.395	.460	.4103	53.3	62.3	55.8	57.55	—10.87	.312	.360	.280	.316	76	64	62	66	N W b N	S b W	N W	N 48 W	3.6	1.6	9.5	3.00	4.23	...	...
20	.527	.534	.574	.5500	52.2	64.8	57.3	59.00	— 9.45	.284	.349	.346	.331	73	56	74	66	W N W	S b W	calm.	S 53 W	4.6	9.5	0.0	2.61	3.90	...	...
21	.581	.565	.625	.5983	52.6	68.8	56.2	59.50	— 8.97	.332	.286	.339	.306	84	40	75	62	calm.	S	N W b W	N 58 W	0.0	6.2	6.2	4.02	6.77	...	...
22	.654	.671	.737	.6933	54.4	67.0	58.0	60.32	— 8.15	.308	.230	.337	.301	73	35	70	60	N b W	N W	W N W	N 53 W	8.0	16.6	7.6	8.55	9.67	...	...
23	—	.729	—	—	—	69.1	—	—	—	—	.297	—	—	—	61	—	—	W	S E b S	N W	S 51 W	6.0	9.8	2.3	2.46	6.64	...	...
24	.827	.811	.797	.8127	52.9	71.7	60.5	63.32	— 5.13	.318	.346	.337	.337	78	44	64	60	N W	S S E	N E	S 77 E	3.2	7.6	3.0	2.14	5.17	...	...
25	.837	.777	.739	.7707	55.1	73.1	64.1	65.92	— 2.50	.321	.377	.359	.371	73	47	59	59	N E	E	N E b E	N 74 E	5.8	9.0	5.0	4.61	5.93	...	...
26	.655	.560	.484	.5545	58.3	74.9	67.7	68.18	— 0.18	.333	.355	.490	.428	68	41	73	63	N E	E S E	S W	S 24 E	5.2	11.0	7.0	3.46	5.98	.050	...
27	.503	.513	.607	.5433	63.4	71.7	60.1	65.43	— 2.93	.508	.531	.401	.486	87	68	77	77	S W b S	W b N	N W	N 77 W	3.0	8.5	9.2	4.99	6.44	.210	...
28	.651	.724	.765	.7243	58.7	69.2	60.9	62.92	— 5.38	.432	.565	.429	.462	87	79	80	80	N W	S b W	N	N 29 W	6.2	5.2	3.0	2.34	4.34	...	...
29	.777	.795	.767	.7650	61.9	69.2	64.8	65.53	— 2.70	.436	.470	.425	.445	79	65	70	71	N	S E b S	calm.	S 74 E	2.4	9.0	0.0	2.18	3.72	...	...
30	—	.664	—	—	—	74.6	—	—	—	—	.157	—	—	—	59	—	—	N b W	S S E	N W b N	S 39 W	4.3	10.8	8.6	1.29	6.85	inap.	...
31	.624	.607	.603	.6118	62.7	75.3	63.7	67.47	— 0.65	.492	.540	.479	.503	86	61	81	75	N b W	S b W	N W b N	N 23 W	6.8	11.5	13.2	4.59	8.12	...	...
	29.5720	29.5420	29.5500	29.5552	59.75	72.93	63.19	65.98	— 1.93	.409	.426	.425	.422	85	57	78	72	.....	.....	.....	.....	3.52	9.72	3.92	.....	5.67	1.255	..

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JULY, 1871

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.842 at 8 a.m. on 24th. } Monthly range=
Lowest Barometer.....29.225 at 4 p.m. on 18th. } 0.617 inches.

Self-registering Ther.
- Maximum temperature.....88°4 on 9th. } Monthly range=
- Minimum temperature.....47.8 on 24th. } 40°6
- Mean maximum temperature.....76°13 } Mean daily range=
- Mean minimum temperature.....55°67 } 20°46
- Greatest daily range.....28°6 from a.m. to p.m. of 18th.
- Least daily range.....10°6 from a.m. to p.m. of 10th.

Warmest day.....13th; mean temperature.....75°40 }
Coldest day.....19th; mean temperature.....57°55 } Difference=17°85.

Maximum Radiation
- Solar.....105°0 on 9th. } Monthly range=
- Terrestrial.....37°4 on 24th. } 67°.6

Aurora observed on 5 nights, viz.:—2nd, 14th, 19th, 20th, and 21st.

Possible to see Aurora on 25 nights; impossible on 6 nights.

Raining on 11 days; depth, 1.255 inches; duration of fall, 12.2 hours.

Mean of cloudiness=0.47.

WIND.

Resultant direction, N. 88° W.; resultant velocity, 1.55.

Mean velocity, 5.67 miles per hour.

Maximum velocity, 24.9 miles, from 1.00 to 2.00 p.m. of 7th.

Most windy day, 7th; mean velocity, 11.10 miles per hour.

Least windy days, 2nd and 11th; mean velocity, 2.37 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 9.50 miles per hour.

Least windy hour, 2 a.m.; mean velocity, 3.60 miles per hour.

The rain fall will be seen from the comparative table to have been the least in any July, with the exception of 1853-6 and 1868.

Solar halves recorded 8th and 10th.

The dew was also less frequent, being only noticed on six mornings.

COMPARATIVE TABLE FOR JULY.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1843	64.5	— 2.8	86.8	38.7	48.1	8	4.605	0	0.0	...	...	0.44 lbs.
1844	66.0	— 1.3	86.6	40.1	46.5	12	2.815	0	0.0	...	...	0.19
1845	66.2	— 1.1	95.0	45.7	49.3	7	2.195	0	0.0	...	...	0.30
1846	68.0	+ 0.7	94.6	44.5	50.1	9	2.895	0	0.0	...	...	0.29
1847	68.0	+ 0.7	87.0	43.2	43.8	18	3.355	0	0.0	...	...	0.19
1848	65.5	— 1.8	82.2	44.1	38.1	10	1.890	0	0.0	N 14 W	0.18	4.94 mls.
1849	68.4	+ 1.1	88.6	45.2	43.4	4	3.415	0	0.0	S 5 W	0.75	3.52
1850	68.9	+ 1.6	86.2	51.6	34.6	12	5.270	0	0.0	N 81 E	0.59	4.56
1851	65.0	— 2.3	82.7	46.5	36.2	12	3.625	0	0.0	N 60 W	0.88	4.13
1852	66.8	— 0.5	90.1	48.5	41.6	8	4.025	0	0.0	N 43 W	0.93	3.33
1853	65.6	— 1.7	91.3	41.6	49.7	10	0.915	0	0.0	S 58 E	0.24	3.69
1854	72.5	+ 5.2	98.0	42.5	55.5	9	4.805	0	0.0	S 49 W	0.37	4.03
1855	67.9	+ 0.6	92.8	49.2	43.6	13	3.245	0	0.0	S 19 W	0.73	6.47
1856	69.9	+ 2.6	96.6	49.5	47.1	8	1.120	0	0.0	N 79 W	1.57	5.84
1857	67.8	+ 0.5	86.6	47.0	39.6	15	3.475	0	0.0	S 68 E	0.81	4.74
1858	67.9	+ 0.6	85.0	52.0	33.0	13	3.072	0	0.0	N 15 E	1.13	5.76
1859	66.9	— 0.4	88.0	44.7	43.3	12	2.611	0	0.0	N 56 W	1.48	5.81
1860	63.9	— 3.4	88.0	43.8	44.2	13	4.336	0	0.0	N 60 W	2.15	7.29
1861	65.4	— 1.9	84.5	47.0	37.5	16	2.635	0	0.0	N 74 W	1.43	4.66
1862	66.7	— 0.6	95.5	48.2	47.3	15	5.344	0	0.0	S 89 W	1.42	5.80
1863	67.6	+ 0.3	83.5	48.0	35.5	15	3.408	0	0.0	N 18 W	0.40	3.89
1864	69.7	+ 2.4	90.2	49.0	41.2	8	1.332	0	0.0	N 61 W	2.23	6.00
1865	65.0	— 2.3	83.0	45.8	37.2	11	2.470	0	0.0	N 86 W	2.28	5.34
1866	70.4	+ 3.1	94.0	47.8	46.2	16	5.390	0	0.0	S 79 W	0.94	4.17
1867	68.2	+ 0.9	94.0	48.2	45.8	12	1.965	0	0.0	N 48 W	1.40	5.45
1868	75.8	+ 8.5	93.4	59.0	34.4	5	0.510	0	0.0	S 87 E	0.72	4.66
1869	64.5	— 2.8	84.9	49.8	35.1	13	4.610	0	0.0	S 67 W	2.01	5.07
1870	68.8	+ 1.5	87.4	48.0	39.4	16	1.896	0	0.0	S 78 W	1.59	4.82
1871	66.0	— 1.3	88.4	47.8	40.6	11	1.255	0	0.0	N 88 W	1.55	5.67
Results to 1870.	67.33	.....	89.16	46.76	42.40	10.65	3.313	0.00	0.00	N 76 W	0.74	4.96
Exc. for 1871.	— 1.35	.....	— 0.76	+ 1.04	— 1.80	+ 0.35	— 2.058	0.00	0.00	...	...	+ 0.71

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—AUGUST, 1871.

Latitude—43° 39′4 *North*. *Longitude*—5*h*. 17*m*. 33*s*. *West*. *Elevation above Lake Ontario*, 108 *feet*.

Day.	Barom. at temp. of 32°				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	M'E'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	M'N.		
					°	°	°	°	°												°						
1	29.620	29.621	29.670	29.6402	60.5	71.3	63.4	65.98	— 2.08	.484	.482	.482	.465	92	62	83	74	N b E	E b S	N E	N 81 E	4.2	12.0	4.0	4.55	5.46	...	...
2	.683	.669	.648	.6683	59.8	78.9	68.1	70.13	+ 2.12	.404	.490	.511	.491	79	49	74	68	N N E	S E b S	S S W	S 31 E	4.8	9.6	0.8	3.60	3.94	...	...
3	.642	.544	.500	.5615	60.9	80.7	72.0	72.82	+ 4.92	.389	.653	.657	.576	72	62	84	71	Calm.	S E	W S W	S 5 E	0.0	10.0	1.6	3.06	3.90	...	...
4	.481	.358	.306	.3803	68.1	83.6	74.6	76.13	+ 8.28	.636	.726	.623	.670	93	63	72	75	S W b W	S S E	N W	S 46 W	3.2	9.0	6.2	3.53	6.23	...	...
5	.360	.411	.454	.4123	65.6	79.3	63.0	69.93	+ 2.18	.416	.233	.362	.343	66	24	63	50	W N W	N W	S S W	N 48 W	1.6	16.4	1.5	6.70	7.22	...	...
6	—	.508	—	—	—	83.6	—	—	—	—	.693	—	—	—	60	—	—	W	N W	W N W	N 56 W	3.5	11.0	3.3	2.29	5.32	...	...
7	.635	.570	.446	.5407	63.4	79.2	71.3	72.03	+ 4.48	.445	.590	.638	.548	76	59	83	70	Calm	E b S	Calm.	S 72 E	0.0	7.4	0.0	3.22	4.71	.120	...
8	.328	.286	.484	.3718	71.7	85.8	67.7	73.98	+ 6.55	.676	.456	.387	.507	87	37	57	62	S W b S	W	W N W	N 89 W	9.5	20.0	10.6	10.71	12.61	...	...
9	.603	.610	.645	.6238	61.2	75.3	63.4	67.53	+ 0.22	.386	.468	.333	.420	71	53	57	62	N W	S S W	N W b N	N 46 W	13.0	13.0	3.4	4.60	6.97	...	...
10	.705	.661	.589	.6463	54.0	76.0	64.1	66.13	— 1.03	.346	.366	.448	.379	83	41	75	63	N W b W	S S E	E b N	S 59 E	8.0	8.0	3.2	2.11	4.20	...	...
11	.530	.490	.604	.5493	59.1	78.2	68.4	69.82	+ 2.77	.425	.574	.507	.526	85	59	73	72	N E b N	E S E	N W b N	N 12 W	3.5	4.0	9.8	4.51	7.31	...	...
12	.722	.740	.843	.7702	59.8	68.8	59.4	62.65	— 4.25	.357	.361	.351	.352	69	51	70	62	N b W	S E b S	N	N 38 E	18.2	9.4	6.8	2.91	7.01	...	...
13	—	.705	—	—	—	70.6	—	—	—	—	.273	—	—	—	36	—	—	N b E	E	N b E	N 55 E	6.3	13.0	4.8	6.04	8.07	...	...
14	.665	.633	.605	.6337	61.6	75.7	65.2	69.52	+ 2.93	.393	.534	.382	.462	71	60	60	63	N b E	S E b S	Calm.	N 87 E	7.4	6.8	0.0	2.83	4.84	...	...
15	.607	.640	.534	.5917	67.7	72.0	70.6	70.77	+ 4.33	.451	.706	.632	.618	68	90	85	82	N E b N	N W	Calm.	S 41 E	4.0	12.8	0.0	0.54	2.67	.330	...
16	.481	.486	.611	.5335	68.1	80.7	63.0	70.88	+ 4.63	.666	.636	.338	.491	97	60	59	66	S b E	N W b W	W N W	N 64 W	1.2	25.0	5.6	9.77	10.83	...	...
17	.711	.699	.657	.6892	59.4	73.5	60.5	64.72	— 1.35	.375	.412	.349	.372	74	50	65	62	N W	S b W	N W b N	N 69 W	12.6	11.0	4.4	4.01	6.83	...	...
18	.572	.524	.631	.5732	54.4	76.7	57.6	64.70	— 1.22	.256	.240	.330	.293	60	26	69	51	W S W	W	N N W	N 83 W	3.2	22.5	2.0	10.87	11.72	...	...
19	.677	.649	.667	.6657	52.9	72.6	61.6	63.35	— 2.33	.318	.222	.368	.309	78	27	67	55	N W b W	N W b N	N	S 8 E	3.8	8.5	2.5	1.71	5.93	...	...
20	—	.379	—	—	—	65.2	—	—	—	—	.483	—	—	—	78	—	—	E S E	N E	N N E	N 50 E	9.3	14.0	7.8	7.79	10.66	.270	...
21	.577	.672	.722	.6678	54.7	64.5	59.4	60.07	— 5.22	.358	.442	.386	.404	84	73	76	78	N b E	E N E	N b W	N 15 E	5.6	1.4	2.6	2.69	3.90	...	...
22	.785	.794	.761	.7830	59.0	72.8	68.1	67.57	+ 2.52	.392	.587	.579	.541	79	73	84	80	N b E	E b N	E b N	N 75 E	5.2	6.4	3.4	4.35	5.16	...	...
23	.807	.729	.701	.7422	66.3	78.9	69.5	72.00	+ 7.15	.589	.628	.618	.614	92	64	86	79	S E	S E	N E	S 14 E	2.5	7.2	0.4	1.64	3.70	.040	...
24	.698	.635	.703	.6867	63.4	80.7	63.0	70.07	+ 5.47	.420	.425	.362	.423	72	40	63	59	N W b N	S b W	N W b N	N 57 W	1.8	4.8	8.4	3.37	6.56	...	...
25	.753	.686	.683	.7048	50.8	72.4	62.7	62.78	— 1.57	.262	.388	.297	.334	72	49	51	59	N W b W	S	N W b N	N 1 W	3.2	6.8	9.5	1.64	5.92	...	...
26	.638	.549	.532	.5637	59.4	62.7	61.2	61.57	— 2.53	.307	.491	.487	.447	60	86	90	81	N E	N E b E	N b W	N 29 E	6.2	14.8	4.4	6.20	7.19	1.036	...
27	—	.478	—	—	—	68.8	—	—	—	—	.528	—	—	—	75	—	—	N	N b W	N N W	N 18 W	7.5	6.5	5.9	4.56	5.88	.020	...
28	.656	.594	.435	.5493	55.8	67.0	67.3	64.17	+ 0.60	.344	.511	.577	.481	77	78	86	79	N b E	E N E	E	N 79 E	4.8	13.0	14.0	7.90	8.98	.100	...
29	.277	.167	.185	.1977	67.7	69.2	65.6	67.78	+ 4.48	.628	.593	.530	.589	92	82	84	86	S E b S	S b W	S W	S 15 W	4.6	15.6	9.5	10.85	11.35	.884	...
30	.208	.161	.296	.2270	63.0	70.6	58.7	64.40	+ 1.33	.487	.349	.327	.398	85	47	67	67	S W b S	S W b S	W b S	S 59 W	11.0	16.4	8.4	11.33	11.98	...	...
31	.483	.628	.745	.6327	53.6	63.4	54.4	57.55	— 5.25	.340	.288	.287	.304	83	49	67	65	W	W b S	N W b W	N 84 W	9.0	6.2	1.2	5.37	5.49	...	...
	29.5890	29.5634	29.5799	29.5780	60.81	74.46	64.59	67.37	+ 1.41	.428	.476	.450	.458	78	56	72	68	.....	.....	.....	.....	5.76	11.05	4.71	.....	6.86	2.800	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR AUGUST, 1871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer .....29.847 at 12 p m. on 12th } Monthly range=
Lowest Barometer.....29.141 at 4 p.m. on 29th } 0.706 inches.

Self-registering Ther.
- Maximum Temperature ..... 89°5 on 16th } Monthly range=
- Minimum Temperature ..... 46°0 on 19th } 43°5
- Mean Maximum Temperature .....77°40 } Mean daily range=
- Mean Minimum Temperature .....57°94 } 19°46
- Greatest daily range.....36°1 from p.m. of 16th to a.m. of 17th.
- Least daily range ..... 9°8 from a m. of 26th to p.m. of 26th.

Warmest Day..... 4th ... Mean Temperature.....76°13 } Difference=18°58
Coldest Day..... 31st ... Mean Temperature.....57°55 }

Maximum Radiation.
- Solar .....106°0 on 16th } Monthly range=
- Terrestrial..... 36°0 on 19th } 70°0

Aurora observed on 4 nights, viz., 10th, 16th, 17th, and 24th.

Possible to see Aurora on 21 nights; impossible on 10 nights.

Raining on 8 days; depth 2.800 inches; duration of fall 29.6 hours.

Mean of Cloudiness=0.51.

WIND.

Resultant Direction N. 52° W.; Resultant Velocity 1.09.

Mean Velocity 6.86 miles per hour.

Maximum Velocity 25.0 miles, from 2 to 3 p.m. of 18th.

Most Windy day 8th; Mean Velocity 12.61 miles per hour.

Least Windy day 15th; Mean Velocity 2.67 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 10.68 miles per hour.

Least Windy hour Mid.; Mean Velocity 3.92 miles per hour.

Thunder with Lightning occurred on 4th, 8th, 15th, 20th, 23rd, 26th, and 29th.

Rainbow on the 30th.

Fog on 7th, 13th, 16th, 17th, and 23rd.

Dew on 1st, 2nd, 11th, 17th, 19th, and 23rd.

Shooting Stars numerous on the night of the 14th.

COMPARATIVE TABLE FOR AUGUST.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°					°		
1843	66.4	+ 0.4	83.1	44.0	39.1	4	4.850	0	0.0	...	...	0.12 lbs
1844	64.3	— 1.7	86.8	43.5	43.3	17	Imp.	0	0.0	...	...	0.16
1845	67.9	+ 1.9	84.8	41.5	43.3	9	1.725	0	0.0	...	...	0.19
1846	68.4	+ 2.4	86.4	49.5	36.9	9	1.770	0	0.0	...	...	0.17
1847	65.1	— 0.9	82.6	44.6	38.0	10	2.140	0	0.0	...	...	0.19
1848	69.2	+ 3.2	87.0	48.7	38.3	8	0.855	0	0.0	S 21 E	0.98	4.55mls
1849	66.3	+ 0.3	79.0	49.0	30.0	10	4.970	0	0.0	N 71 W	0.60	3.76
1850	66.8	+ 0.8	85.0	41.0	44.0	13	4.355	0	0.0	N 15 E	0.35	4.46
1851	63.6	— 2.4	79.8	42.0	37.8	10	1.360	0	0.0	N 63 W	0.40	4.63
1852	65.9	— 0.1	81.2	45.8	35.4	9	2.695	0	0.0	N 70 E	0.56	3.30
1853	68.6	+ 2.6	94.9	42.5	52.4	11	2.575	0	0.0	S 36 E	0.30	4.26
1854	68.0	+ 2.0	99.2	45.6	53.6	5	0.455	0	0.0	N 64 W	1.76	4.60
1855	64.1	— 1.9	83.5	40.0	43.5	7	1.455	0	0.0	N 63 W	1.04	6.97
1856	63.6	— 2.4	82.7	41.5	41.2	12	1.680	0	0.0	N 50 W	2.88	7.03
1857	65.3	— 0.7	88.2	46.0	42.2	13	5.265	0	0.0	S 77 W	1.51	6.36
1858	67.6	+ 1.6	84.0	44.0	40.0	11	3.890	0	0.0	N 69 W	1.57	6.50
1859	66.6	+ 0.6	82.2	45.8	36.4	11	3.900	0	0.0	N 56 W	1.62	5.96
1860	64.5	— 1.5	87.0	46.8	40.2	14	3.405	0	0.0	N 70 W	1.83	5.80
1861	65.5	— 0.5	85.2	47.0	38.2	15	2.953	6	0.0	N 8 E	0.46	4.21
1862	67.6	+ 1.6	89.5	42.8	46.7	15	3.483	0	0.0	N 78 W	1.67	5.96
1863	66.6	+ 0.6	88.0	42.4	45.6	12	2.208	0	0.0	S 61 W	1.80	4.89
1864	68.6	+ 2.6	94.0	47.0	47.0	16	5.060	0	0.0	N 70 W	1.38	4.75
1865	65.2	— 0.8	87.8	44.4	43.4	8	1.990	0	0.0	N 60 W	1.55	5.07
1866	60.8	— 5.2	77.0	42.4	34.6	14	4.457	0	0.0	N 59 W	2.53	5.16
1867	68.1	+ 2.1	95.2	42.2	53.0	10	2.440	0	0.0	N 76 W	1.25	4.52
1868	67.2	+ 1.2	84.4	46.8	37.6	13	1.562	0	0.0	S 58 W	1.01	6.15
1869	63.6	— 2.4	89.0	43.5	45.5	11	4.273	0	0.0	N 42 W	1.98	5.13
1870	67.1	+ 1.1	84.0	40.0	44.0	14	3.422	0	0.0	N 75 W	1.80	5.92
1871	67.4	+ 1.4	89.5	46.0	43.5	8	2.800	0	0.0	N 52 W	1.09	6.86
Resu'ts to 1870.	66.04	...	86.12	44.29	41.83	10.9	3.029	0	0.0	N 67 W	1.10	5.21
Excess for '71.	+ 1.33	...	+ 3.38	+ 1.71	+ 1.67	— 2.9	— 0.229	0	0.0	...	...	+ 1.65

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—SEPTEMBER, 1871.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 PM	M'E'N.	Excess of Mean above Normal.	Tension of Vapour. 6 A.M	2 P.M.	10 P.M.	M'N.	Humidity of Air. 6 A.M	2 P.M.	10 P.M.	M'N.	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN	Rain in inches.	Snow in inches.
1	29.855	29.876	29·877	29.8753	47.5	66.6	55.1	57.72	— 4.85	·293	·363	·396	·353	89	55	91	75	Calm.	S E b S	Calm.	S 19 E	0.0	2.2	0.0	1.30	1.35	...	...
2	.942	.885	.842	.8847	52.6	70.6	63.0	63.13	+ 0.88	.334	.399	.413	.391	84	53	71	68	Calm.	S E b S	S S W	S 19 E	0.0	11.5	0.8	3.35	3.53	...	...
3	—	.803	—	—	—	73.8	—	—	—	—	.605	—	—	—	72	—	—	S S W	S	N E b E	S 40 E	0.8	6.0	1.8	1.36	2.05	...	...
4	.751	.667	.642	.6823	62.7	75.7	64.1	67.78	+ 6.10	.544	.653	.550	.578	95	73	92	86	Calm.	S E	Calm.	S 26 E	0.0	6.8	0.0	1.87	1.94	...	...
5	.619	.576	.540	.5727	62.3	80.7	65.9	70.58	+ 9.20	.472	.636	.500	.543	84	61	78	73	S b W	S	Calm.	S 9 W	0.5	12.0	0.0	5.30	5.43	...	...
6	.457	.386	.507	.4608	67.0	76.7	60.5	67.83	+ 6.78	.581	.550	.271	.465	87	60	50	66	S S W	W	N W b W	N 86 W	4.8	14.0	14.2	8.41	10.43	...	...
7	.697	.757	.836	.7743	47.9	64.5	53.3	55.95	— 4.77	.250	.218	.271	.267	74	35	67	61	W N W	N b E	N b W	N 18 W	3.5	5.5	11.8	4.33	5.63	...	...
8	.951	.930	.852	.9132	48.6	63.0	60.5	57.97	— 2.38	.230	.294	.372	.296	67	50	70	61	N N E	E	E b S	S 70 E	3.2	11.5	5.6	6.14	7.37	...	...
9	.831	.764	.830	.8037	52.6	73.1	65.2	65.07	+ 5.08	.342	.498	.458	.440	86	62	74	72	Calm.	S	N N W	S 59 W	0.0	12.6	8.8	2.45	8.49	.050	...
10	—	.925	—	—¾	—	64.5	—	—	—	—	.239	—	—	—	39	—	—	N E b N	N N E	N	N 2 W	5.6	6.6	7.8	6.28	7.83	...	...
11	30.029	.998	.987	30.0018	50.8	66.6	56.9	58.68	— 0.52	.283	.353	.286	.315	76	54	61	64	N	S S E	N b W	N 57 E	6.3	2.6	8.8	1.16	4.43	...	...
12	29.991	.926	.869	29.9195	51.8	67.4	55.1	58.42	— 0.40	.207	.280	.375	.290	53	42	87	61	N b E	Calm.	Calm.	S 62 E	4.0	0.0	0.0	0.41	0.87	...	...
13	.815	.803	.923	.8583	46.4	69.2	52.9	55.50	— 2.92	.269	.234	.174	.212	85	32	43	51	Calm.	N W b W	N	N 25 W	0.0	15.5	3.4	6.81	6.89	...	...
14	30.069	30.034	.941	.9945	39.2	51.1	51.5	48.42	— 9.60	.139	.208	.264	.220	57	55	69	62	N b E	E	E b S	N 82 E	3.8	6.8	9.0	5.31	5.93	inap.	...
15	29.788	29.676	.567	.6703	54.0	52.6	52.9	52.75	— 4.87	.335	.353	.371	.344	80	89	92	86	E b S	E b S	N W	S 76 E	7.6	9.5	1.2	4.34	7.28	.425	...
16	.565	.562	.548	.5563	52.2	60.9	57.6	57.02	— 0.20	.348	.379	.353	.373	89	71	74	80	N W b W	S b W	Calm.	N 70 W	1.9	5.2	0.0	2.42	2.84	.100	...
17	—	.794	—	—	—	52.9	—	—	—	—	.221	—	—	—	56	—	—	W	N W b N	Calm.	N 44 W	8.3	26.0	0.0	10.16	10.42	...	...
18	.944	.793	.508	.7220	37.4	53.3	53.6	49.55	— 6.82	.170	.250	.340	.267	76	62	83	74	N N E	E S E	Calm.	S 54 E	3.0	3.2	0.0	3.53	4.90	.005	...
19	.491	.474	.619	.5117	55.4	57.6	47.5	53.87	— 2.07	.418	.330	.216	.316	94	69	65	74	Calm.	N W	N b W	N 49 W	0.0	17.0	10.2	7.71	8.21	...	...
20	.727	.780	.888	.8070	36.3	49.0	40.3	42.70	—12.85	.160	.169	.184	.174	75	48	73	65	Calm.	N W	N W b N	N 30 W	0.0	9.0	5.8	5.44	5.76	...	...
21	.989	30.006	.954	.9752	34.5	50.0	37.8	41.85	—13.27	.136	.212	.191	.179	67	58	82	67	N b W	S b W	Calm.	N 33 E	3.2	3.6	0.0	0.81	2.00	...	...
22	.915	29.762	.596	.7410	37.4	59.4	47.5	50.87	— 3.82	.188	.307	.293	.276	83	60	89	74	N b E	S E b S	Calm.	S 9 E	6.0	6.6	0.0	3.15	3.73	...	...
23	.455	.353	.365	.3847	58.7	68.8	64.5	64.30	+10.03	.408	.462	.467	.450	82	65	76	74	S W b S	S b W	W b S	S 42 W	7.0	10.2	11.0	6.77	7.19	...	...
24	—	.420	—	—	—	67.7	—	—	—	—	.175	—	—	—	25	—	—	S W b W	W b N	Calm.	N 76 W	2.7	24.0	0.0	7.54	7.59	...	...
25	.595	.521	.489	.5205	42.8	62.3	53.6	53.80	+ 0.38	.240	.236	.351	.287	87	41	85	72	Calm.	W b S	W N W	S 82 W	0.0	7.2	4.0	2.13	3.00	.650	...
26	.353	.338	.357	.3468	47.9	51.8	43.9	47.93	— 5.05	.312	.249	.235	.263	93	64	82	79	Calm.	W b S	W S W	S 77 W	0.0	15.0	4.2	5.91	5.96	.030	...
27	.335	.300	.367	.3323	42.5	50.8	45.7	46.87	— 5.73	.244	.330	.268	.273	89	89	88	84	S W	S b W	Calm.	S 66 W	3.5	5.8	0.0	5.34	5.68	.030	...
28	.426	.530	.710	.5715	39.6	49.7	42.8	44.28	— 7.90	.220	.236	.213	.226	90	65	77	77	Calm.	N W b W	W N W	N 60 W	0.0	16.0	12.4	10.24	10.35	...	...
29	.825	.901	.952	.9008	38.1	52.6	41.0	44.02	— 7.73	.179	.192	.210	.196	77	48	82	69	W N W	N W	W b N	N 55 W	4.5	15.0	0.8	5.90	6.05	...	...
30	.974	.942	.912	.9390	38.8	58.7	45.8	48.40	— 2.98	.203	.305	.225	.244	86	62	70	73	W	S E b S	Calm.	S 66 W	2.2	2.8	0.0	1.28	1.99	...	...
	29.7423	29.7131	29.7107	29.7200	47.88	61.64	53.06	54.82	— 2.43	.289	.334	.317	.317	81	59	76	71	.....	.....	.....	.....	2.75	9.66	4.05	.....	5.50	1.290	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR SEPTEMBER, 1871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer .....30.090 at 10 a.m. on 14th, } Monthly range=
Lowest Barometer .....29.300 at 2 p.m. on 27th. } 0.790

Self-registering Ther.
- Maximum temperature.....81°8 on 5th. } Monthly range=
- Minimum temperature.....34.0 on 21st. } 47°8
- Mean maximum temperature.....64°53 } Mean daily range=
- Mean minimum temperature.....46°90 } 17°63
- Greatest daily range..... 31°5 from p.m. of 13th to a.m. of 14th.
- Least daily range.....6°4 from a.m. to p.m. of 15th.

Warmest day.....5th; mean temperature 70°58 } Difference=28°73
Coldest day.....21st; mean temperature 41°85 }

Maximum Solar.....92°4 on 6th. } Monthly range=
Radiation Terrestrial.....25°0 on 21st. } 67°4

Aurora observed on 4 nights, viz.: 4th, 6th, 7th and 19th.

Possible to see aurora on 20 nights; impossible on 10 nights.

Raining on 8 days; depth, 1.290 inches; duration of fall, 27.7 hours.

WIND.

Resultant direction, N. 74° W.; Resultant velocity, 1.72.

Mean velocity, 5.50 miles per hour.

Maximum velocity, 26.0 miles, from 1.30 p.m. to 2.30 p.m. of 17th.

Most windy day, 6th; mean velocity, 10.43 miles per hour.

Least windy day, 12th; mean velocity, 0.87 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 9.55 miles per hour.

Least windy hour, 4 a.m.; mean velocity, 2.34 miles per hour.

Fog on 1st, 4th, 5th, 13th, 16th and 19th.

Dew on 12 occasions.

First Frost of Season on 18th.

Ice on 21st and 22nd.

Thunder on 3rd and 18th.

Lightning on 18th.

COMPARATIVE TABLE FOR SEPTEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	V'locity.	Mean Velocity.
	°	°	°	°	°					°		
1843	59.1	+ 0.9	89.0	32.2	56.8	10	9.760	.....	.....	...	...	0.57 lbs
1844	58.6	+ 0.4	81.8	28.2	53.6	4	imp.	.....	.....	...	...	0.26
1845	56.0	— 2.2	79.6	34.0	45.6	16	6.245	.....	.....	...	...	0.34
1846	63.6	+ 5.4	84.3	37.3	47.0	11	4.595	.....	.....	...	...	0.33
1847	55.6	— 2.6	74.5	35.0	39.5	15	6.665	.....	.....	...	...	0.33
1848	54.2	— 4.0	80.4	28.1	52.3	11	3.115	.....	.....	N 71 W	2.38	5.81mls
1849	58.2	0.0	80.1	32.7	47.4	9	1.480	.....	.....	N 75 W	0.69	4.23
1850	56.5	— 1.7	76.0	29.5	46.5	11	1.735	.....	.....	S 65 W	1.02	4.78
1851	60.0	— 1.8	86.3	32.0	54.3	9	2.665	.....	.....	N 14 E	1.03	5.45
1852	57.5	— 0.7	81.8	35.8	46.0	10	3.630	.....	.....	N 77 W	0.53	4.60
1853	58.8	+ 0.6	85.5	33.9	51.6	12	5.140	.....	.....	N	1.06	4.33
1854	61.0	+ 2.8	93.6	35.8	57.8	14	5.375	.....	.....	N 22 W	1.33	4.04
1855	59.5	+ 1.3	82.6	33.0	49.6	12	5.585	.....	.....	N 20 E	1.29	7.61
1856	57.1	— 1.1	78.4	35.0	43.4	13	4.105	.....	.....	S 79 W	1.98	6.53
1857	58.6	+ 0.4	82.0	34.1	47.9	11	2.640	.....	.....	N 68 W	1.61	5.55
1858	59.1	+ 0.9	81.4	35.6	45.8	8	0.735	.....	.....	S 74 W	1.53	5.69
1859	55.2	— 3.0	75.4	35.7	39.7	15	3.525	.....	.....	N 44 W	1.60	6.36
1860	55.3	— 2.9	75.8	28.7	47.1	14	1.959	.....	.....	N 71 W	2.63	5.79
1861	59.1	+ 0.9	78.8	37.1	41.7	17	3.607	.....	.....	N 71 W	1.39	4.81
1862	59.6	+ 1.4	79.4	39.0	40.4	9	2.344	.....	.....	N 59 W	1.07	5.11
1863	55.9	— 2.3	80.0	31.4	48.6	8	1.235	.....	.....	N 16 W	0.92	6.46
1864	56.4	— 1.8	73.0	37.8	35.2	11	2.508	.....	.....	N 38 W	1.89	7.06
1865	64.5	+ 6.3	90.5	42.0	48.5	12	2.450	.....	.....	S 56 E	0.47	4.12
1866	55.2	— 3.0	80.0	34.4	45.6	15	5.657	.....	.....	N 33 W	1.45	4.63
1867	57.9	— 0.3	87.0	31.8	55.2	9	1.226	.....	.....	N 37 W	1.48	5.43
1868	56.6	— 1.6	75.5	36.0	39.5	16	4.239	.....	.....	N 74 W	0.88	6.68
1869	60.7	+ 2.5	81.0	34.4	46.6	8	4.027	.....	.....	N 53 W	1.16	4.89
1870	61.8	+ 3.6	78.0	45.8	32.2	11	6.794	.....	.....	N 29 E	2.26	5.04
1871	54.8	— 3.4	81.8	34.0	47.8	8	1.290	.....	.....	N 74 W	1.72	5.50
Results to 1870.	58.15	.....	81.13	34.51	46.62	11.16	3.797	.....	.....	N 50 W	1.04	5.43
Excess for '71.	— 3.33	.....	+ 0.67	— 0.51	+ 1.18	— 3.16	— 2.507	.....	.....	...	...	+ 0.07

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—OCTOBER, 1871.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°												°						
1	—	29.789	—	—	—	65.2	—	—	—	—	.297	—	—	—	48	—	—	Calm.	S S W	W S W	S 31 W	0.0	10.3	3.3	3 46	3.65	Inap.	...
2	29.711	.550	29.444	29.5497	47.1	65.9	56.2	56.28	+ 5.70	.291	.399	.360	.343	90	62	80	76	Calm.	S B E	S B E	S 10 W	0.0	16.0	4.5	4.79	5.21	.100	...
3	.308	.310	.196	.2598	54.4	58.0	53.6	55.83	+ 5.60	.385	.336	.319	.343	90	70	78	77	S W B S	W B S	S W B S	S 71 W	5.5	16.5	9.5	8.43	9.22	Inap.	...
4	.345	.444	.536	.4523	48.2	62.8	46.1	53.25	+ 3.40	.264	.229	.244	.244	78	39	78	63	W	W B S	N N E	S 88 W	8.6	18.2	1.0	5.69	8.68	...	...
5	.427	.348	.385	.3795	48.2	66.3	56.2	56.72	+ 7.20	.286	.324	.360	.324	86	50	80	72	E B N	S S W	N B E	S 26 W	3.0	13.0	3.0	4.14	5.54	Inap.	...
6	.332	.468	.659	.5057	54.0	55.5	44.3	50.65	+ 1.52	.335	.201	.212	.244	80	45	72	65	W B S	W N W	W N W	N 61 W	0.6	19.8	6.2	10.79	11.05	...	...
7	.753	.762	.793	.7735	31.3	45.4	36.7	39.00	— 9.78	.151	.188	.163	.165	86	61	75	71	Calm.	S B W	W B S	S 20 W	0.0	5.6	1.0	1.64	2.42	...	...
8	—	.774	—	—	—	58.7	—	—	—	—	.273	—	—	—	55	—	—	W S W	S B W	S W	S 25 W	0.8	15.0	5.0	5.19	5.44	...	...
9	.746	.613	.557	.6327	45.0	66.3	54.7	56.18	+ 8.05	.258	.419	.347	345	86	65	81	76	Calm.	S S W	S	S 18 W	0.0	15.0	0.5	7.76	7.82	...	...
10	.495	.347	.475	.4388	52.9	63.4	51.8	55.88	+ 8.07	.306	.369	.237	.302	76	63	61	66	S	S S W	W	S 37 W	4.5	8.2	20.0	8.00	9.26	.115	...
11	.620	.683	.707	.6738	42.1	50.8	46.8	46.55	— 0.97	.222	.238	.249	.244	83	63	79	77	S W B W	W B N	E B N	S 80 W	2.0	5.9	1.0	2.47	2.87	Inap.	...
12	.728	.787	.912	.8175	38.9	53.3	43.5	45.18	— 2.00	.168	.260	.186	.202	70	63	66	66	N N W	S W B S	W B N	S 83 W	3.8	9.0	4.0	1.91	3.15	...	...
13	30.018	.956	.826	.9282	36.0	58.0	50.0	48.72	+ 1.82	.197	.229	.251	.238	93	47	69	71	W N W	S B E	S B E	S 19 E	1.8	8.8	7.2	4.97	5.66	...	...
14	29.741	.709	.587	.6775	51.8	56.2	54.4	54.07	+ 7.47	.311	.382	.395	.360	81	84	93	86	S S W	S S W	E S E	S 15 W	4.6	10.4	4.0	8.29	8.97	.035	...
15	—	.535	—	—	—	53.6	—	—	—	—	.216	—	—	—	52	—	—	S W B S	W	W S W	S 77 W	23.2	28.4	2.7	14.66	15.26	..	...
16	.747	.615	.686	.6848	40.7	55.8	42.5	45.77	— 0.20	.214	.184	.199	.202	83	41	73	67	W S W	W S W	W B N	S 69 W	1.8	13.8	3.4	6.56	7.62	...	...
17	.735	.670	.623	.6772	34.9	47.9	43.9	42.40	— 3.38	.169	.202	.235	.208	84	60	82	77	W N W	S B W	W	S 73 W	1.8	6.8	9.0	5.62	7.76	Inap.	...
18	.731	.834	.816	.6013	39.2	43.2	34.5	39.03	— 6.50	.198	.129	.144	.157	83	45	72	66	N W B W	N W	Calm.	N 62 W	14.2	22.0	0.0	7.40	9.25	.060	...
19	.621	.235	.546	.4670	40.7	56.9	45.0	48.85	+ 3.58	.214	.253	.175	.207	84	54	58	61	S B E	S W B S	W	N 88 W	7.6	15.0	11.5	13.47	17.41	...	...
20	.875	.995	30.036	.9747	36.3	43.2	33.1	38.62	— 6.43	.168	.146	.131	.157	78	51	70	67	N	N W	N N E	N 27 W	9.6	13.0	4.6	4.26	8.55	...	...
21	.904	.682	29.626	.7297	34.5	56.0	51.5	47.92	+ 3.12	.174	.255	.274	.237	88	57	71	71	S S E	S B W	S W	S 35 W	3.3	8.2	5.5	5.60	6.31	...	...
22	—	.507	—	—	—	71.0	—	—	—	—	.244	—	—	—	32	—	—	S S W	S W B W	S W	S 45 W	5.8	23.5	11.6	9.47	9.64	...	...
23	.499	.504	.708	.5788	55.8	62.3	50.8	55.98	+11.67	.332	.420	.233	.331	75	75	63	71	W B S	S S W	N	N 48 W	10.8	5.0	10.0	4.64	7.81	...	....
24	.802	.852	.924	.8697	41.4	46.4	43.2	43.10	— 0.95	.204	.203	.198	.196	78	64	70	70	N N E	E	N E B E	N 62 E	6.0	7.4	11.5	6.51	6.72	...	...
25	.873	.772	.715	.7807	39.6	50.0	51.1	47.27	+ 3.47	.150	.294	.341	.264	62	81	90	78	N E B E	E N E	E B S	N 72 E	9.8	13.2	7.5	10.30	10.52	.050	...
26	.638	.435	.496	.5202	50.4	60.9	51.5	53.53	+ 9.95	.320	.390	.347	.354	86	74	91	86	E B S	E B S	W B S	S 3 E	7.4	8.0	9.6	3.75	7.89	.510	...
27	.459	.254	.303	.3367	43.5	53.3	40.3	44.87	+ 1.52	.241	.271	.201	.233	85	66	80	78	S W B S	S W	W B N	S 68 W	4.2	13.0	2.7	7.79	9.32	.065	...
28	.415	.521	.651	.5462	36.3	42.5	40.3	39.58	— 3.52	.160	.155	.184	.165	75	57	73	68	W B S	W B S	W B S	S 84 W	13.5	23.8	14.6	11.61	12.43	...	...
29	—	.875	—	—	—	45.0	—	—	—	—	.184	—	—	—	61	—	—	N W	N B W	N N E	N 23 W	4.0	10.0	4.3	1.87	5.15	...	...
30	.859	.672	.806	.7793	41.7	49.3	45.3	45.45	+ 2.82	.192	.232	.217	.211	72	65	71	69	S E	E B N	N W B W	N 78 E	10.4	4.0	5.8	1.44	4.91	...	...
31	.878	.711	.389	.6217	40.7	46.8	46.1	44.70	+ 2.28	.187	.216	.282	.235	73	67	91	79	N W B N	E B N	E	N 66 E	2.8	8.6	16.6	4.83	7.64	.250	...
	29.6638	29.6050	29.6308	29.6329	43.29	54.48	46.67	48.28	+ 1.99	.234	.266	.249	.250	81	60	76	72	.....	.....	.....	.....	5.53	12.75	6.49	...	7.84	1.185	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR OCTOBER, 1871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.042 at 8 a.m. on 13th. } Monthly range=
Lowest Barometer.....29.163 at midnight on 3rd. } 0.879.

Self-registering Ther.

Maximum Temperature.....72°2 on 22nd. } Monthly range=
Minimum Temperature.....28°6 on 31st. } 43 6.
Mean Maximum Temperature.....58°26. } Mean daily range=
Mean Minimum Temperature.....40°76. } 17°50.
Greatest daily range.....30°8 from p.m. of 18th to p.m. of 19th.
Least daily range..... 8°3 from a.m. to p.m. of 6th.

Warmest day.....5th...Mean Temperature.....56°72. } Difference=18°10.
Coldest day.....20th...Mean Temperature.....38°62. }

Maximum Radiation. { Solar ..... 82°2 on 22nd. } Monthly range=
{ Terrestrial ..... 19°8 on 7th. } 62°4.

Aurora observed on 3 nights, viz.: 6th, 16th, and 17th.
Possible to see Aurora on 15 nights; impossible on 16 nights.
Raining on 12 days; depth 1.185 inches; duration of fall 30.2 hours.
Mean of Cloudiness, 0.68.

WIND.

Resultant Direction S. 66° W.; Resultant Velocity 3.75 miles.
Mean Velocity 7.84 miles per hour.
Maximum Velocity 36.0 miles, from 8 to 9 a.m. of 15th.
Most Windy day 19th; Mean Velocity 17.41 miles per hour.
Least Windy day 7th; Mean Velocity 2.42 miles per hour.
Most Windy hour 2 p.m; Mean Velocity 12.73 miles per hour.
Least Windy hour 1 a.m.; Mean Velocity 4.40 miles per hour.

Fog recorded on 9 occasions during month.
Solar halo, 9th; Lunar halo on 24th and 30th.
Thunder storms on 5th and 26th; Rainbows on 1st and 18th.
21st, Large Meteor in W. at 8.30 p.m, colour bright blue.
Particles of Snow are reported to have fallen on the afternoon of the 17th, in the University Grounds.

COMPARATIVE TABLE FOR OCTOBER.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1843	41.8	— 4.0	68.0	24.2	43.8	12	3.790	4	2.5	...	...	0.54 lbs
1844	43.3	— 2.5	71.6	15.9	55.7	7	Imp.	4	12.0	...	...	0.43
1845	46.4	+ 0.6	64.0	19.7	44.3	11	1.760	1	Inap	...	...	0.26
1846	44.6	— 1.2	70.1	20.7	49.4	14	4.180	2	Inap.	...	...	0.44
1847	44.0	— 1.8	64.6	20.4	44.2	13	4.390	2	Inap.	...	...	0.19
1848	46.3	+ 0.5	61.8	24.5	37.3	11	1.550	...	...	N 54 W	1.24	4.60mls
1849	45.3	— 0.5	58.9	24.2	34.7	13	5.965	1	Inap.	N 12 W	1.27	7.76
1850	25.4	— 0.4	66.7	22.4	44.3	10	2.085	...	...	N 66 W	1.10	5.30
1851	47.4	+ 1.6	66.2	25.2	41.0	10	1.680	2	0.3	S 72 W	1.06	4.39
1852	48.0	+ 2.2	70.7	23.8	46.9	12	5.280	...	...	N 5 E	1.19	4.47
1853	44.4	— 1.4	64.7	23.4	41.3	10	.875	2	Inap.	S 88 W	1.74	4.77
1854	49.5	+ 3.7	75.4	26.4	49.0	15	1.495	3	Inap.	N 45 W	1.52	4.57
1855	45.4	— 0.4	58.0	22.6	45.4	14	2.485	5	0.8	N 82 W	4.91	9.88
1856	45.3	— 0.5	71.4	23.0	48.4	10	.875	2	0.1	N 76 W	2.15	6.07
1857	45.4	— 0.4	64.0	26.5	37.5	10	1.040	2	0.2	N 19 W	2.93	6.24
1858	48.8	— 3.0	76.3	31.5	44.8	17	1.797	1	Inap.	N 34 W	0.36	5.96
1859	43.0	— 2.8	69.8	22.3	47.5	11	.940	4	Inap.	N 68 W	5.04	8.12
1860	47.3	+ 1.5	68.0	28.4	39.6	15	1.618	1	Inap.	N 9 W	2.00	6.93
1861	48.7	+ 2.9	71.0	29.0	42.0	15	1.993	1	Inap.	N 61 W	1.06	5.96
1862	48.7	+ 2.9	76.6	26.2	50.4	19	2.684	2	0.5	N 78 W	2.89	6.53
1863	45.9	+ 0.1	66.4	30.5	35.9	16	2.522	...	...	S 71 W	0.48	6.16
1864	45.2	— 0.6	67.0	28.0	39.0	22	3.321	1	Inap	N 60 W	3.17	6.66
1865	44.5	— 1.3	71.4	21.6	49.8	17	2.705	3	4.5	N 36 W	3.55	7.26
1866	49.1	+ 3.3	71.0	31.8	39.2	11	2.470	1	Inap.	N 30 W	0.84	5.53
1867	49.9	+ 4.1	75.4	31.0	44.4	11	1.970	...	...	N 45 W	1.51	5.73
1868	42.4	— 3.4	67.6	24.0	43.6	10	1.368	2	2.0	N 89 W	1.27	7.10
1869	42.3	— 3.5	69.8	18.7	51.1	8	.962	7	2.3	N 89 W	3.72	6.73
1870	50.0	+ 4.2	68.5	30.2	38.3	16	2.690	...	...	N 85 W	1.86	7.11
1871	48.3	+ 2.5	72.2	28.6	43.6	13	1.185	...	...	S 66 W	3.75	7.84
Results to 1870.	45.78	...	68.75	24.86	43.89	12.48	2.429	1.87	0.90	N 60 W	1.80	6.12
Excess for 71°	+ 2.50	...	+ 3.45	+ 3.74	— 0.29	+ 0.52	— 1.244	— 1.87	— 0.90	...	...	+ 1.72

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—NOVEMBER, 1871.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Relative Humidity				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N.		6 A.M	2 P.M.	10 P.M.	M'N.	6 A.M	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°																			
1	29.215	29.516	29.626	29.4790	47.1	41.0	39.2	41.12	— 1.05	.279	.166	.197	.192	86	65	82	73	N W b W	N W b W	W	N 65 W	23.6	28.0	2.8	13.05	13.67	...	...
2	.555	.552	.687	.6148	39.2	45.0	40.3	40.95	— 0.97	.172	.193	.201	.187	72	64	80	73	S W	W b S	S W b W	N 84 W	6.5	10.4	10.0	5.63	7.18	inap.	...
3	.862	.877	.829	.8535	31.6	41.0	36.0	35.82	— 5.87	.141	.115	.137	.138	79	45	65	67	N W	N N W	N E	N 19 E	2.0	4.4	2.0	1.46	2.67	...	...
4	.742	.671	.674	.6963	38.1	39.9	37.0	37.87	— 3.55	.179	.164	.176	.169	77	66	80	74	E b S	E	N E b N	N 70 E	10.0	14.8	7.5	8.51	9.59	...	...
5	—	.753	—	—	—	39.2	—	—	—	—	.155	—	—	—	65	—	—	N N E	N b W	N W	N 22 W	2.3	9.2	3.6	5.00	5.59	...	...
6	.896	.890	.849	.8827	25.5	29.1	28.0	27.58	—13.32	.112	.118	.111	.113	81	74	71	75	N b W	N W b W	W b N	N 45 W	8.4	11.4	9.2	7.15	7.76	...	inap.
7	.832	.748	.557	.6958	23.3	42.5	36.3	34.27	— 6.32	.103	.070	.125	.111	83	26	59	60	W b N	W N W	S W b W	S 85 W	0.8	17.5	4.2	7.72	8.06	...	...
8	.438	.452	.510	.4800	38.1	42.8	36.0	38.20	— 2.12	.187	.118	.129	.144	80	41	61	63	W	N W	W N W	N 57 W	6.2	20.6	3.5	8.70	8.83	...	...
9	.571	.571	.437	.5267	29.8	40.3	38.5	36.73	— 3.27	.126	.141	.156	.145	76	56	67	66	W N W	S b E	E b N	N 88 E	4.5	4.6	11.2	7.32	8.78	.050	...
10	.262	.118	.458	.2915	37.8	41.7	37.0	37.93	— 1.75	.199	.247	.150	.194	87	93	67	84	E b S	N W	W N W	N 45 W	15.6	6.6	26.0	5.65	11.26	.195	inap.
11	.774	.974	30.152	.9938	35.3	36.7	28.0	32.50	— 6.80	.171	.119	.124	.135	82	54	81	73	N W b N	N W	N b W	N 43 W	8.2	22.5	3.4	10.71	10.97	...	inap.
12	—	30.253	—	—	—	31.3	—	—	—	—	.115	—	—	—	65	—	—	N b E	E S E	N E	N 68 E	1.3	6.0	4.5	4.04	4.64	...	...
13	30.050	29.809	29.551	.7770	32.7	40.3	42.5	38.68	+ 0.08	.173	.150	.182	.163	91	58	66	69	E S E	E b N	E b N	N 83 E	12.0	19.2	12.2	13.50	13.57	...	...
14	29.309	.166	.064	.1663	42.6	41.4	42.1	41.58	+ 3.35	.184	.250	.245	.229	67	95	91	87	E b S	E b N	N E b E	N 47 E	8.8	12.8	19.5	11.44	15.86	2.310	0.2
15	.047	.256	.425	.2693	34.5	28.4	20.8	26.78	—11.05	.173	.119	.094	.124	86	77	84	84	N W b N	N W	N W	N 40 W	30.5	36.5	32.5	32.08	32.10	inap	2.0
16	.576	.643	.763	.6723	20.1	25.5	24.8	23.58	—13.87	.093	.097	.114	.105	85	71	85	82	N W b W	N W b N	N W	N 37 W	21.0	19.6	8.8	13.36	13.49	...	...
17	.865	.950	30.037	.9673	25.5	31.6	29.7	28.97	— 8.05	.126	.148	.148	.143	91	83	90	90	N W b N	N N W	N b W	N 18 W	4.5	8.8	3.6	5.35	5.79	...	...
18	30.068	30.053	29.969	30.0310	31.6	30.6	35.3	31.95	— 4.68	.163	.138	.181	.158	91	80	88	87	W N W	N b W	E b S	N 68 E	5.8	7.0	9.5	4.37	7.04	...	...
19	—	29.742	—	—	—	41.7	—	—	—	—	.192	—	—	—	71	—	—	E b S	E S E	S b W	S 57 E	10.7	11.4	7.6	6.36	7.98	.040	...
20	29.636	.584	.616	29.6138	43.0	39.6	35.4	38.97	+ 3.25	.238	.176	.153	.186	85	72	74	77	S W b S	S W b W	S W b W	S 62 W	10.4	10.0	13.4	11.74	11.82	inap	...
21	.545	.435	.319	.4285	34.5	35.2	33.1	33.92	— 1.37	.149	.140	.167	.149	74	69	88	76	S W b W	S W	W b S	S 57 W	14.0	15.0	8.6	11.99	12.29	...	inap.
22	.226	.158	.410	.2802	30.6	32.7	23.0	28.28	— 6.53	.138	.129	.107	.119	80	68	86	76	W b S	W S W	W	S 81 W	10.0	17.2	8.4	11.60	12.17	...	0.2
23	.637	.678	.584	.6307	20.1	29.8	30.2	27.13	— 7.23	.092	.091	.114	.100	85	54	67	68	W	S S W	S E b S	S 24 E	3.6	4.6	18.6	8.58	10.68	...	0.2
24	.378	.243	.501	.3870	32.0	39.6	33.4	34.95	+ 1.05	.129	.220	.150	.165	71	90	78	80	S E	S S W	W b S	S 42 W	14.0	16.0	15.5	10.29	14.58	inap.	1.5
25	.798	.876	.744	.7977	31.6	32.7	34.2	33.15	— 0.25	.126	.121	.152	.139	70	65	77	73	W b S	W N W	E S E	S 2 E	11.0	2.2	9.0	2.33	5.37	inap.	...
26	—	.368	—	—	—	43.5	—	—	—	—	.127	—	—	—	85	—	—	S S E	W b S	W b S	N 64 W	6.8	14.6	6.0	7.65	9.12	.060	...
27	.616	.736	.813	.7340	23.0	17.9	13.6	17.08	—15.37	.098	.053	.060	.070	79	55	76	73	N W b N	N W b N	N N W	N 23 W	21.0	14.5	8.6	12.61	12.83	...	inap.
28	.825	.715	.627	.7280	6.0	11.4	9.6	8.95	—23.02	.055	.051	.059	.054	95	70	89	84	N	N E	N b E	N 17 E	7.6	14.5	16.0	10.20	10.79	...	0.4
29	.694	.771	.813	.7708	7.5	14.0	9.3	9.28	—22.22	.053	.061	.057	.055	89	76	87	84	N b W	N W b N	N b W	N 47 W	6.8	20.0	10.5	9.14	9.59	...	inap.
30	.888	.884	.836	.8702	2.8	13.6	11.4	9.38	—21.65	.040	.060	.067	.056	84	76	94	73	N W	W b N	W S W	N 76 W	4.8	10.4	9.0	5.82	6.37	...	...
	29.6271	29.6279	29.6481	29.6397	29.38	33.24	30.18	30.60	— 6.64	.142	.133	.137	.136	82	67	78	76	.....	.....	.....	.....	9.76	13.34	10.51	.....	10.35	2.655	4.5

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR NOVEMBER, 1871

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer .....30.315 at 8 a.m. on 12th. } Monthly range=
Lowest Barometer.....29.012 at mid. on 14th. } 1.303

Self-registering Ther.
- Maximum temperature.....47°1 on 1st. } Monthly range=
- Minimum temperature.....0.0 on 30th. } 47°1
- Mean maximum temperature.....36°97 } Mean daily range=
- Mean minimum temperature.....26°12 } 10°85
- Greatest daily range.....20°8 from a.m. to p.m. of 7th.
- Least daily range.....4°0 from a.m. to p.m. of 21st.

Warmest day.....1st; mean temperature 41°12 } Difference=32°17
Coldest day.....28th; mean temperature 8°95 }

Maximum Solar.....62°0 on 2nd. } Monthly range=
Radiation Terrestrial.....—9°6 on 30th. } 71°6

Aurora observed on 5 nights, viz.: 2nd, 3rd, 9th, 11th and 21st.

Possible to see aurora on 11 nights; impossible on 19 nights.

Snowing on 12 days; depth 4.5 inches; duration of fall 41.7 hours.

Raining on 10 days; depth, 2.655 inches; duration of fall, 40.5 hours.

WIND.

Resultant direction, N. 45° W.; Resultant velocity, 4.08.

Mean velocity, 10.35 miles per hour.

Maximum velocity, 37.0 miles, from 3 to 4 p.m. of 15th.

Most windy day, 15th; mean velocity, 32.16 miles per hour.

Least windy day, 3rd; mean velocity, 2.67 miles per hour.

Most windy hour, noon; mean velocity, 13.49 miles per hour.

Least windy hour, 2 a.m.; mean velocity, 8.14 miles per hour.

Solar haloes on 6th and 13th. Lunar halo on 23rd.

During the early part of the month barometer fluctuating very considerably.

This month is the coldest November yet recorded, the mean being 6.1 below the average; the mean of each of the last three days being colder than any day in a similar month.

The velocity of the wind on the 15th is the greatest daily velocity ever recorded at the Observatory.

COMPARATIVE TABLE FOR NOVEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°							
1843	33.5	— 3.2	52.6	14.1	38.5	10	4.765	7	1.2	°	...	0.59 lbs
1844	34.9	— 1.8	56.0	12.1	43.9	8	imp.	4	8.0	...	...	0.48
1845	36.8	+ 0.1	59.5	8.1	51.4	7	1.105	4	5.0	...	...	0.53
1846	41.3	+ 4.6	55.6	18.0	37.6	12	5.805	2	0.4	...	...	0.64
1847	38.6	+ 1.9	57.9	8.7	49.2	14	3.155	3	inap.	...	...	0.36
1848	34.5	— 2.2	49.0	15.9	33.1	9	2.020	3	1.4	N 81 W	1.81	4.81 mls
1849	42.6	+ 5.9	56.4	26.5	29.9	10	2.815	2	1.0	N 39 W	1.55	4.78
1850	38.8	+ 2.1	62.8	11.0	51.8	7	2.955	1	inap.	N 42 W	1.43	5.27
1851	32.9	— 3.8	50.2	13.8	36.4	5	3.885	6	6.7	N 50 W	1.25	4.70
1852	36.0	— 0.7	50.4	18.2	32.2	7	1.775	3	2.0	N 59 W	1.53	6.50
1853	38.7	+ 2.0	55.6	12.8	42.8	15	2.425	6	2.7	N 9 W	0.55	5.52
1854	36.8	+ 0.1	55.4	13.8	41.6	13	1.115	4	1.3	West.	3.44	7.54
1855	38.6	+ 1.9	59.2	15.5	43.7	8	4.590	6	3.0	N 66 W	3.18	10.81
1856	37.4	+ 0.7	56.4	18.8	37.6	10	1.375	9	9.5	S 85 W	2.95	8.75
1857	33.5	— 3.2	58.2	— 3.5	61.7	14	3.235	9	6.9	S 61 W	5.45	9.25
1858	34.2	— 2.5	53.0	15.3	37.7	12	3.879	13	4.0	N 25 W	3.14	8.87
1859	38.9	+ 2.2	62.6	21.8	40.8	12	5.193	9	0.6	N 81 W	3.39	9.65
1860	37.9	+ 1.2	64.5	13.2	51.3	12	2.569	8	1.9	S 89 W	4.95	11.02
1861	37.1	+ 0.4	52.4	23.0	29.4	14	4.294	8	3.2	N 46 W	1.94	7.44
1862	35.6	— 1.1	58.0	16.2	41.8	11	2.205	11	5.3	N 46 W	3.00	6.60
1863	39.1	+ 2.4	67.0	17.8	49.2	13	3.656	6	0.1	N 88 W	3.50	7.86
1864	36.9	+ 0.2	60.2	21.0	39.2	11	3.765	8	4.5	S 72 W	3.82	7.64
1865	38.6	+ 1.9	63.2	23.6	39.6	5	0.975	7	1.1	N 79 W	2.98	7.90
1866	38.4	+ 1.7	54.2	21.8	32.4	13	2.963	4	2.2	N 88 W	3.06	6.96
1867	36.9	+ 0.2	60.4	9.6	50.8	8	1.835	9	0.9	N 87 W	4.02	7.76
1868	36.2	— 0.5	50.5	20.1	30.4	14	5.150	10	4.3	N 35 W	2.10	8.16
1869	32.7	— 4.0	58.0	13.0	45.0	9	2.540	18	10.2	N 78 W	3.69	8.12
1870	36.6	— 0.1	57.2	19.4	37.8	6	0.594	5	3.1	N 89 W	4.36	8.74
1871	30.6	— 6.1	47.1	0.0	47.1	10	2.655	12	4.5	N 45 W	4.08	10.35
Results to 1870	36.72	.....	57.01	15.70	41.31	10.03	2.987	6.71	3.23	N 78 W	2.65	7.59
Excess for '71.	— 6.12	.....	— 9.91	— 15.70	+ 5.79	— 0.03	— 0.332	+ 5.29	+ 1.27	...	...	+ 2.76

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above aver'ge.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°																		
1	29.815	29.637	29.682	29.7052	11.1	21.4	16.8	17.67	—12.87	.059	.097	.072	.079	82	74	78	81	N b w	S W	W b S	S 85 W	3.4	14.0	1.4	4.76	6.52	...	0.2
2	.770	.670	.614	.6793	14.3	28.6	32.4	25.53	— 4.52	.065	.115	.139	.112	79	75	75	78	N N E	S W b S	S W b S	S 40 W	2.2	11.8	11.6	10.59	10.93	...	...
3	—	.487	—	—	—	39.6	—	—	—	—	.176	—	—	—	72	—	—	S W	S	S	S	6.3	13.2	9.2	9.55	10.06	0.010	...
4	.094	28.995	.281	.1403	37.8	30.6	15.8	26.60	— 2.50	.217	.153	.066	.127	95	89	74	80	S b E	W S W	W b N	S 87 W	14.2	20.5	25.5	19.09	20.45	...	0.1
5	.401	29.521	.629	.5320	11.8	10.4	12.5	11.57	—17.07	.058	.039	.062	.054	78	54	80	72	W	W b N	W	N 89 W	18.0	26.0	14.0	15.69	16.21	...	Inap.
6	.639	.373	.058	.3323	14.0	21.5	26.6	20.75	— 7.42	.007	.089	.134	.097	83	77	93	83	S W b	S S W	S W b S	S 38 W	16.0	25.4	22.2	17.93	18.90	...	0.5
7	.161	.223	.207	.2110	29.1	30.6	32.0	30.18	+ 2.45	.126	.131	.128	.131	79	76	71	78	S W b W	W S W	W b S	S 70 W	13.6	13.5	20.5	13.14	13.40	...	1.5
8	.343	.419	.521	.4473	25.2	20.5	20.5	21.73	— 5.55	.113	.080	.087	.089	85	73	79	76	S W b W	W S W	S W b W	S 64 W	13.0	22.0	18.4	16.77	16.98	...	0.1
9	.714	.861	.799	.8000	18.7	21.2	17.6	18.92	— 7.98	.083	.079	.075	.076	81	70	78	74	N W b W	W S W	S W	S 69 W	17.5	10.6	11.6	12.82	13.94	...	...
10	—	.416	—	—	—	25.2	—	—	—	—	.101	—	—	—	75	—	—	S W b W	S W b W	W S W	S 54 W	18.7	19.4	12.5	13.58	13.62	...	...
11	.450	.315	.450	.4172	29.5	33.4	32.0	31.10	+ 5.05	.136	.163	.165	.148	83	85	92	84	S W b W	S W b S	W N W	S 73 W	17.5	9.4	8.0	5.70	7.33	...	0.1
12	.675	.645	.468	.5932	22.3	30.9	32.7	28.88	+ 3.22	.100	.119	.151	.125	83	69	80	78	W N W	E S E	E S E	S 64 E	2.2	5.0	13.2	7.53	7.97	...	2.0
13	.209	.339	.593	.4247	32.7	25.9	15.8	24.32	— 0.95	.172	.121	.073	.119	91	86	81	85	E b S	N W	W	N 64 W	7.2	15.0	12.0	8.27	10.43	...	1.0
14	.599	.663	.756	.6810	13.2	17.9	17.2	14.80	—10.09	.062	.072	.087	.069	79	74	92	81	W b N	W N W	N N W	N 70 W	3.2	13.6	1.6	7.16	8.06	...	0.1
15	.715	.654	.607	.6520	9.6	24.1	24.4	19.56	— 5.05	.058	.086	.097	.081	87	65	74	76	N	W S W	S	S 2 E	6.6	5.0	12.0	4.55	6.80	...	0.1
16	.536	.392	.441	.4503	25.2	29.5	34.5	30.20	+ 5.97	.109	.151	.136	.132	80	92	69	79	S S E	S S W	S W b S	S 18 W	13.6	18.8	20.0	14.60	16.49	...	1.0
17	—	.693	—	—	—	31.3	—	—	—	—	.122	—	—	—	69	—	—	W S W	W S W	N W b W	S 78 W	17.5	17.8	5.2	9.88	11.01	...	0.1
18	.695	.661	.801	.7213	23.7	29.8	25.5	26.02	+ 2.42	.115	.111	.111	.112	91	66	81	80	N N E	W b S	W b S	N 76 W	16.5	14.4	10.0	5.91	7.52	...	0.3
19	.587	.350	.271	.3847	21.2	21.2	10.4	17.36	— 6.03	.108	.075	.055	.079	94	64	79	80	N E b N	W b S	W S W	S 72 W	1.4	25.6	13.0	13.27	13.40	...	1.0
20	.112	.284	.663	.3793	6.7	-1.6	-12.2	-3.86	—26.87	.046	.032	.020	.033	78	81	86	84	W S W	N W b N	N W	N 62 W	15.6	27.0	12.0	12.67	14.54	...	0.1
21	.831	.867	.880	.8593	-20.4	3.1	6.8	-2.57	—25.42	.014	.036	.045	.033	86	76	76	80	Calm.	S W b W	W S W	S 70 W	0.0	5.0	10.5	7.12	7.35	...	Inap.
22	.967	.948	.785	.8773	10.0	17.9	23.7	18.00	— 4.62	.059	.085	.118	.092	87	87	93	89	W S W	N E b E	E b S	S 83 E	2.0	4.0	12.0	7.71	8.94	...	3.5
23	.486	.115	.241	.2797	34.2	39.6	38.5	37.53	—15.12	.161	.228	.148	.181	81	94	63	79	E b S	E b S	W S W	S 47 W	9.4	8.6	37.5	9.94	17.59	.380	..
24	—	.774	—	—	—	32.7	—	—	—	—	.157	—	—	—	85	—	—	W S W	S W b S	Calm.	S 25 W	9.8	1.0	0.0	3.33	4.96	...	...
25	—	.549	—	—	—	33.4	—	—	—	—	.163	—	—	—	85	—	—	W b S	N W b W	N W b N	N 41 W	1.4	20.4	11.1	9.60	10.70	...	...
26	.858	.753	.519	.6847	5.0	13.2	15.8	11.75	—10.12	.042	.065	.078	.064	80	83	88	85	N b W	N E	N N E	N 10 W	12.8	5.4	5.0	5.33	7.20	...	1.5
27	.439	.616	.867	.6718	20.8	15.8	8.2	14.93	— 7.66	.091	.060	.050	.063	81	67	82	75	W b S	W b S	S W b W	S 70 W	12.6	26.5	16.0	21.35	21.71	...	1.0
28	.991	.984	.836	.9350	4.6	10.4	14.7	9.88	—11.73	.042	.043	.067	.051	79	62	78	74	S W b W	W S W	W b S	S 58 W	13.5	18.0	5.2	9.66	9.75	...	...
29	.663	.705	.817	.7395	17.6	24.1	17.9	19.68	— 1.83	.075	.080	.079	.078	79	61	80	74	Calm.	W b N	N	N 10 E	0.0	2.4	5.0	2.63	3.75	...	...
30	.879	.775	.574	.7278	22.3	25.5	33.4	27.92	+ 6.47	.101	.118	.182	.138	85	87	95	88	E N E	E b N	E b N	N 76 E	9.0	20.4	10.6	11.58	11.64	.230	...
31	—	.566	—	—	—	39.9	—	—	—	—	.234	—	—	—	95	—	—	Calm.	Calm.	N W b N	N 39 W	0.0	0.0	20.8	8.85	9.00	.320	...
	29.5888	29.5506	29.5744	29.5734	17.61	21.94	20.54	19.90	— 4.90	.091	.097	.097	.094	83	77	81	80	.....	.....	.....	.....	9.51	14.18	12.50	...	11.52	0.940	14.2

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR DECEMBER, 1871.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer..... 30.027 at 8 a.m. on 28th. } Monthly range=
Lowest Barometer..... 28.976 at 4 p.m. on 23rd. } 1.051.

Sol-registering Ther.
- Maximum Temperature..... 48°2 on 23rd. } Monthly range=
- Minimum Temperature .....—21°0 on 21st } 69 2.
- Mean Maximum Temperature .....29°63. } Mean daily range=
- Mean Minimum Temperature .....14°90. } 14°73.
- Greatest daily range.....34°3 from a.m. to p.m. of 22nd.
- Least daily range ..... 4°3 from a.m. to p.m. of 19th.

Warmest day.....23rd...Mean Temperature.....37°53. } Difference=41°33.
Coldest day .....20th...Mean Temperature..... — 3°80 }

Maximum { Solar ..... 54°8 on 17th. } Difference=82°6.
Radiation. { Terrestrial ... . — 27°8 on 21st. }

Aurora observed on 2 nights, viz.: 8th and 14th.

Possible to see Aurora on 13 nights; impossible on 18 nights.

Snowing on 20 days; depth 14.2 inches; duration of fall 102.1 hours.

Raining on 4 days; depth 0.940 inches; duration of fall 23.8 hours.

Mean of Cloudiness, 0.81.

WIND.

Resultant Direction S. 70° W.; Resultant Velocity 6.91 miles.

Mean Velocity 11.52 miles per hour.

Maximum Velocity 45.0 miles, from 11 a.m. to noon on 20th.

Most Windy day 27th; Mean Velocity 21.71 miles per hour.

Least Windy day 29th; Mean Velocity 3.73 miles per hour.

Most Windy hour 2 p.m; Mean Velocity 13.92 miles per hour.

Least Windy hour 7 a.m.; Mean Velocity 9.07 miles per hour.

COMPARATIVE TABLE FOR DECEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1843	30.6	+ 4.0	48.5	3.1	45.4	6	1.040	8	8.1	...	...	0.53 lbs
1844	28.2	+ 2.2	48.5	1.6	46.9	6	Imp.	6	4.2	...	...	0.40
1845	21.1	— 4.9	39.7	— 2.4	42.1	2	Inap.	12	4.7	...	...	0.70
1846	27.5	+ 1.5	49.2	3.9	45.3	5	1.215	9	6.0	...	...	0.57
1847	30.1	+ 4.1	49.6	0.3	49.3	7	1.185	8	6.8	...	...	0.55
1848	29.1	+ 3.1	48.8	1.1	47.7	7	2.750	7	16.5	S 83 W	1.12	5.44mls
1849	26.5	+ 0.5	40.8	— 6.5	47.3	5	0.840	12	9.6	N 82 W	2.56	6.23
1850	21.7	— 4.3	48.8	— 9.0	57.8	2	0.190	18	29.5	N 44 W	2.93	7.40
1851	21.5	— 4.5	44.0	—14.8	58.8	6	1.075	15	10.7	N 82 W	4.00	7.37
1852	31.9	+ 5.9	51.0	13.2	37.8	7	3.995	10	20.1	S 69 W	1.03	6.54
1853	25.3	— 0.7	46.4	— 8.4	54.8	4	0.625	13	22.3	N 35 W	2.39	4.98
1854	21.9	— 4.1	44.8	— 7.0	51.8	5	0.590	12	17.2	N 44 W	4.30	8.56
1855	26.8	+ 0.8	47.0	— 5.2	52.2	6	1.845	10	29.5	S 88 W	5.29	11.38
1856	22.9	— 3.1	42.2	— 9.1	51.3	6	1.790	20	16.3	S 87 W	4.62	11.56
1857	31.9	+ 5.9	46.0	4.7	41.3	7	3.205	14	9.0	N 89 W	2.50	6.84
1858	27.4	+ 1.4	45.4	4.2	41.2	11	1.657	18	10.4	N 78 W	1.66	9.36
1859	17.9	— 8.1	54.8	— 6.0	60.8	3	1.035	23	37.4	N 53 W	4.29	10.77
1860	24.0	— 2.0	39.0	— 7.0	46.0	3	1.362	21	13.5	N 62 W	4.66	10.14
1861	31.1	+ 5.1	55.2	5.5	49.7	6	0.560	8	6.8	N 72 W	3.50	7.96
1862	28.8	+ 2.8	50.1	— 3.4	53.5	5	1.945	8	10.4	N 73 W	3.17	7.58
1863	27.0	+ 1.0	53.4	— 1.5	54.9	10	2.960	17	7.1	N 41 W	1.61	9.40
1864	24.7	— 1.3	50.4	—10.4	60.8	9	2.045	18	27.1	S 82 W	4.94	9.98
1865	27.7	+ 1.7	54.2	5.7	48.5	7	1.727	11	5.2	S 81 W	3.07	7.33
1866	25.1	— 0.9	51.0	— 5.0	56.0	7	2.790	13	15.5	S 88 W	4.98	9.91
1867	21.6	— 4.4	49.5	—12.8	62.3	7	1.408	21	13.6	S 81 W	4.82	10.32
1868	22.5	— 3.5	44.2	— 3.2	47.4	1	0.005	18	15.5	N 71 W	4.05	9.80
1869	28.7	+ 2.7	45.0	6.0	39.0	10	2.590	9	7.1	S 80 W	2.31	8.44
1870	26.5	+ 0.5	45.2	— 5.8	51.0	6	2.430	16	15.9	N 89 W	5.06	11.46
1871	19.9	— 6.1	48.2	—21.0	69.2	4	0.940	20	14.2	S 70 W	6.91	11.52
Results to 1870.	26.04	...	47.60	—2.43	50.03	5.77	1.678	13.39	14.14	N 77 W	3.13	8.64
Excess for 71	— 6.14	...	+ 0.60	18.57	19.17	— 1.77	— 0.738	+ 6.61	+ 0.06	...	...	+ 2.88

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1871.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY,

Latitude 43° 39′ 4″ North. Longitude 5h. 17m. 33s. West. Elevation above

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.
Mean temperature	21.34	24.33	34.65	42.95	54.15	61.39	65.98
Difference from average (31 years)	— 1.86	+ 1.36	+ 5.13	+ 1.88	+ 2.60	— 0.23	— 1.35
Thermic anomaly (lat. 43° 40′)	—11.46	—10.37	— 5.45	— 7.05	— 3.95	— 3.21	— 2.72
Highest temperature	46.4	48.0	58.5	72.8	85.0	83.0	88.4
Lowest temperature	— 13.2	— 15.8	17.0	26.4	32.4	41.2	47.8
Monthly and annual ranges	59.6	63.8	41.5	46.4	52.6	41.8	40.6
Mean maximum temperature	28.41	30.36	41.42	52.81	63.67	71.47	76.13
Mean minimum temperature	13.41	17.03	28.89	35.57	43.93	52.17	55.67
Mean daily range	15.00	13.33	12.23	17.24	19.74	19.30	20.46
Greatest daily range	34.6	27.0	21.5	31.3	32.2	29.6	28.6
Mean height of the Barometer	29.7590	29.6311	29.5695	29.4584	29.6185	29.5431	29.5552
Difference from average (30 years)	+.1173	+.0062	—.0326	—.1362	+.0501	—.0320	—.0406
Highest barometer	30.388	30.119	29.969	30.116	29.952	29.975	29.842
Lowest barometer	29.048	28.673	29.074	29.014	29.265	29.039	29.225
Monthly and annual ranges	1.340	1.446	0.895	1.102	0.687	0.756	0.617
Mean humidity of the air	84	77	76	69	63	69	72
Mean elasticity of aqueous vapour	0.110	0.109	0.154	0.194	0.283	0.382	0.422
Mean of cloudiness	0.80	0.71	0.70	0.71	0.48	0.46	0.47
Difference from average (18 years)	+ 0.08	— 0.01	+ 0.08	+ 0.11	— 0.08	— 0.07	— 0.03
Resultant direction of the wind	N. 49° W.	N. 70° W.	N. 31° W.	N. 48° W.	N. 23° W.	N. 80° W.	N. 88° W.
" velocity of the wind	2.56	4.26	2.59	1.86	2.53	2.04	1.55
Mean velocity (miles per hour)	9.84	9.87	8.31	8.85	7.70	6.57	5.67
Difference from average (23 years)	+ 1.62	+ 1.29	— 0.52	+ 0.75	+ 1.00	+ 1.42	+ 0.71
Total amount of rain	0.864	0.040	2.782	3.318	2.302	3.340	1.255
Difference from average (31 years)	—0.376	—0.883	+1.537	+0.908	—0.983	+0.374	—2.058
Number of days of rain	8	3	8	17	7	13	11
Total amount of snow	43.6	23.0	13.0	1.3	...	...	...
Difference from average (28 years)	+27.67	+ 3.83	+ 0.81	— 1.13	— 0.07	...	...
Number of days of snow	23	15	12	2	...	...	...
Number of fair days	5	11	14	13	24	17	20
Number of auroras observed	3	4	5	6	9	5	5
Possible to see aurora (No. of nights)	9	12	16	19	24	24	25
Number of thunder storms	0	0	1	2	1	3	6

REGISTER FOR THE YEAR 1871.

TORONTO, ONTARIO.

Lake Ontario, 108 feet. Approximate elevation above the Sea, 342 feet.

Aug.	Sept.	Oct.	Nov.	Dec.	1871.	1870.	1869.	1868.	1867.	1866.	1865.
°	°	°	°	°	°	°	°	°	°	°	°
67.37	54.82	48.28	30.60	19.90	43.81	45.93	43.13	43.33	43.84	43.51	44.92
+ 1.33	— 3.33	+ 2.50	— 6.12	— 6.14	— 0.35	+ 1.77	— 1.03	— 0.83	— 0.32	— 0.65	+ 0.76
— 1.13	— 6.68	— 5.52	—12.60	—16.10	— 7.19	— 5.07	— 7.87	— 7.67	— 7.16	— 7.49	— 6.08
89.5	81.8	72.2	47.1	48.2	89.5	88.4	89.0	93.4	95.2	94.0	90.5
46.0	34.0	28.6	0.0	— 21.0	— 21.0	— 6.6	— 5.4	— 15.6	— 12.8	— 14.0	— 10.0
43.5	47.8	43.6	47.1	69.2	110.5	95.0	94.4	109.0	108.0	108.0	100.5
77.40	64.53	58.26	36.97	29.63	...	...	...	...	...	...	...
57.94	46.90	40.76	26.12	14.90	...	...	...	...	...	...	...
19.46	17.63	17.50	10.85	14.73	16.46	15.71	14.61	15.26	15.47	14.99	15.43
28.5	27.6	30.8	20.8	34.3	34.6	36.2	33.6	38.7	31.6	40.8	36.9
29.5780	29.7200	29.6329	29.6397	29.5734	29.6066	29.5956	29.5970	29.6421	29.6140	29.6216	29.6330
—.0450	+.0514	—.0161	+.0294	—.0783	—.0105	—.0215	—.0201	+.0250	—.0031	+.0045	+.0159
29.847	30.090	30.042	30.315	30.027	30.388	30.212	30.223	30.445	30.332	30.940	30.354
29.141	29.300	29.163	29.012	28.976	28.673	28.166	28.793	28.824	28.768	28.807	28.707
0.706	0.790	0.879	1.303	1.051	1.715	2.046	1.430	1.621	1.564	2.133	1.647
68	71	72	76	80	73	76	77	76	74	75	75
0.458	0.317	0.250	0.136	0.094	0.242	0.279	0.252	0.264	0.252	0.248	0.259
0.51	0.56	0.68	0.77	0.81	0.64	0.62	0.66	0.64	0.61	0.61	0.61
+ 0.03	+ 0.07	+ 0.07	+ 0.03	+ 0.06	+ 0.03	+ 0.01	+ 0.05	+ 0.03	0.00	0.00	0.00
°	°	°	°	°	°	°	°	°	°	°	°
N. 52 w.	N. 74 w.	S. 66 w.	N. 45 w.	S. 70 w.	N. 72 w.	N. 45 w.	N. 64 w.	N. 57 w.	N. 60 w.	N. 73 w.	N. 66 w.
1.09	1.72	3.75	4.08	6.91	2.49	1.61	2.55	1.47	2.05	2.83	1.98
6.86	5.50	7.84	10.35	11.52	8.24	7.33	7.20	7.69	7.00	7.41	6.78
+ 1.65	+ 0.07	+ 1.72	+ 2.76	+ 2.88	+ 1.28	+ 0.37	+ 0.24	+ 0.73	+ 0.04	+ 0.45	— 0.18
2.800	1.290	1.185	2.655	0.940	22.771	33.898	31.182	29.408	19.041	34.209	26.599
—0.229	—2.507	—1.244	—0.332	—0.738	—6.531	+4.596	+1.880	+1.106	-10.261	+4.907	—2.703
8	8	13	10	4	110	116	115	103	100	126	111
...	...	...	4.5	14.2	99.6	122.9	84.6	78.7	110.5	52.1	63.3
...	...	— 0.90	+ 1.27	+ 0.06	+31.54	+54.84	+16.54	+10.64	+42.44	—15.96	— 4.76
...	...	...	12	20	84	77	81	82	84	69	68
21	22	18	15	7	187	185	180	190	181	180	201
4	4	3	5	2	55	77	47	50	43	44	55
21	20	15	11	13	209	206	182	193	202	209	201
6	0	2	0	1	22	34	32	25	23	24	17

TEMPERATURE.

	1871.	Average of 31 years.	Extremes.	
	°	°	°	°
Mean temperature of the year	43.81	44.16	46.36 in '46	42.16 in '56
Warmest month	August.	July	July, 1868	Aug. 1860
Mean temperature of the warmest month	67.37	67.33	75.80	64.46
Coldest month	December	February	Jan. 1857	Feb. 1848
Mean temperature of the coldest month	19.90	22.97	12.75	26.60
Difference between the temperatures of the warmest and the coldest months	47.47	44.36	...	...
Mean of deviations of monthly means from their respective averages of 31 years, signs of deviation being disregarded	2.81	2.42	3.59 in 1843	1.31 in 1864
Months of greatest deviation without regard to sign	December	January	Jan. 1857	...
Corresponding magnitude of deviation	6.14	3.87	10.4	...
Warmest day	Aug. 4	...	July 14, '68	July 31, '44
Mean temperature of the warmest day	76.13	77.73	84.50	72.75
Coldest day	Feb. 4	...	Feb. 6, '55 Jan. 22, '57	Dec. 22, '42
Mean temperature of the coldest day	—7.2	—1.05	—14.38	9.57
Date of the highest temperature	Aug. 16	...	Aug. 24, '54	Aug. 19, '40
Highest temperature	89.5	90.8	99.2	82.4
Date of the lowest temperature	Dec 21	...	Jan. 10, '59	Jan. 2, '42
Lowest temperature	—21.0	—12.1	—26.5	1.9
Range of the year	110.5	102.9	118.2	87.0

BAROMETER.

	1871.	Average of 30 years.	Extremes.	
Mean pressure of the year	29.6066	29.6171	29.6670 in 1849	29.5602 in 1864
Month of highest mean pressure	January	Sept.	Jan. 1849	June, 1864
Highest mean monthly pressure	29.7590	29.6686	29.8046	29.6525
Month of lowest mean pressure	April	May	March, 1859	Nov. 1849
Lowest mean monthly pressure	29.4584	29.5684	29.4143	29.5886
Date of the highest pressure in the year	Jan. 25, 2 p.m.	...	Jan. 8, '66	Jan. 14, '70
Highest pressure	30.388	30.374	30.940	30.212
Date of the lowest pressure in the year	Feb. 18, 6 a.m.	...	Jan. 2, '70	Mar. 17, '45
Lowest pressure	28.673	28.680	28.166	28.939
Range of the year	1.715	1.694	2.133 in 1866	1.303 in 1845

RELATIVE HUMIDITY.

	1871.	Average of 29 years.	Extremes.	
Mean humidity of the year	73	77	82 in 1851	73 in 1858
Month of greatest humidity	January	January	Jan. 1857	Dec. 1858
Greatest mean monthly humidity	84	83	89	81
Month of least humidity	May	May	Feb. 1843	April, 1849
Least mean monthly humidity	63	71	58	76

EXTENT OF SKY CLOUDED.

	1871.	Average of 18 years.	Extremes.	
Mean cloudiness of the year	0.64	0.61	0.66 in '69	0.57 in '56
Most cloudy month	December	December	...	...
Greatest monthly mean of cloudiness	0.81	0.75	0.83	0.73
Least cloudy month	June	August	...	...
Lowest monthly mean of cloudiness	0.46	0.48	0.29	0.50

WIND.

	1871.	Result of 23 years.	Extremes.	
Resultant direction	N 72° W	N 60° W	...	...
Resultant velocity in miles	2.49	1.89	...	...
Mean velocity, without regard to direction	8.24	6.96	8.55 in '60	5.10 in '53
Month of greatest mean velocity	December	March	March, 1860	Jan. 1848
Greatest monthly mean velocity	11.52	8.83	12.41	5.82
Month of least mean velocity	Sept.	July	Aug. 1852	Sept. 1860
Least monthly mean velocity	5.50	4.96	3.30	5.79
Day of greatest mean velocity	Nov. 15	...	Nov. 15, '70	Dec. 2, 1848
Greatest daily mean velocity	32.16	23.12	32.16	15.30
Day of least mean velocity	Sept. 12	...	...	...
Least daily mean velocity	0.87	...	...	...
Hour of greatest absolute velocity	Dec. 20. 11 a.m. to noon.	...	Dec. 27, '61, 9 to 10 a.m.	Mar. 14, '53 11 to noon.
Greatest velocity	45.0	39.2	46.0	25.6

RAIN.

	1871.	Average of 31 years.	Extremes.	
Total depth of rain in inches	22.771	29.302	43.555 in '43	19.041 in '67
Number of days in which rain fell	110	109	130 in 1861	80 in 1841
Month in which the greatest depth of rain fell.	June	Sept.	Sept. 1843	Sept. 1848
Greatest depth of rain in one month	3.340	3.797	9.760	3.115
Month in which the days of rain were most frequent	April	October	Oct. 1864, June 1869.	May, 1841
Greatest number of rainy days in one month	17	12	22	11
Day in which the greatest amount of rain fell.	Nov. 14	...	Sept. 14, '43	Sept. 14, '48
Greatest amount of rain in one day	2.310	2.064	3.455	1.000

SNOW.

	1871.	Average of 28 years.	Extremes.	
Total depth in the year in inches	99.6	68.1	122.9 in '70	38.4 in '51
Number of days in which snow fell	84	62	87 in 1859	33 in 1848
Month in which the greatest depth of snow fell.	January	February	March, 1870	Dec. 1851
Greatest depth of snow in one month	43.6	19.17	62.4	10.7
Month in which the days of snow were most frequent	January	January	Jan. '61, '71	Feb. 1848
Greatest number of days of snow in one month.	23	14	23	8
Day in which the greatest amount of snow fell.	Feb. 17	...	Feb. 5, 1863 Mar. 27, '70	Jan. 10, '57
Greatest fall of snow in one day	12.0	9.3	16.0	5.5

DIFFERENCE OF CERTAIN METEOROLOGICAL ELEMENTS FROM THEIR NORMAL VALUES FOR EACH QUARTER, AND FOR THE YEAR, FROM DECEMBER, 1870, TO NOVEMBER, 1871.

QUARTERS.	Barometer.	Temperature.	Rain.	Days Rain.	Snow.	Days Snow.	Velocity of Wind.	Clouded Sky.
		°	in.		in.		miles.	
Winter	0.0000	0.00	—0.481	+ 2.72	+33.32	+ 9.50	+ 1.95	+ .03
Spring	— 0.0396	+ 3.20	+1.462	+ 4.07	— 0.38	— 0.01	+ 0.41	+ .04
Summer	— 0.0392	— 0.08	—1.913	— 1.42	...	...	+ 1.26	— .02
Autumn	+ 0.0216	— 2.32	—4.083	— 2.67	+ 1.27	+ 5.29	+ 1.52	+ .06
Year	— 0.0143	+ 0.20	—5.015	+ 2.70	+34.21	+14.78	+ 1.28	+ .03

PERIODICAL OR OCCASIONAL EVENTS, 1871.

January	17.	Bay frozen over completely.
"	31.	Snow almost disappeared.
February	17.	Severe snow storm from N. E.
"	28.	Crows seen.
March....	1.	Robins seen.
"	2.	First thunder storm.
"	10.	Blue birds arrived in neighbourhood.
"	13.	Ice on bay broken up and mostly driven into lake.
"	18.	First schooner left.
"	18.	Wild geese passing.
April	6.	Swallows arrived.
"	7.	Butterflies seen. Frogs heard.
"	12.	Last snow.
"	13.	Steamer "City of Toronto," first trip.
May	8.	Last ice.
"	13.	Humming birds.
"	15.	Baltimore birds.
"	18.	Woodpeckers.
"	21.	1 a.m.—shock of an earthquake felt generally in Canada.
"	30.	Fireflies seen.
June.....	16.	Last frost of season.
August...	20.	Vegetation suffering very much from the want of rain.
"	22.	Swallows gone. Nighthawks numerous.
Sept.....	18.	First frost of season.
"	21.	First ice.
Oct.....	17.	First snow, very slight.
Nov.	14.	Heaviest rain storm of the year, followed by a furious gale of wind from the N. W. Average velocity, 32.16 miles; the most windy day recorded here.
"	15.	First snow storm.
"	30.	River Don frozen.
Dec.	13.	Bay frozen and crossed.
"	15.	Sleighing in city.
"	21.	Lowest temperature of year, and the lowest recorded in any December. For a short time at the beginning of this cold spell the velocity of the wind was 62.0 miles per hour.

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THE CANADIAN JOURNAL.

NEW SERIES.

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CONTEMPORANEITY OF STRATA AND THE DOCTRINE OF GEOLOGICAL CONTINUITY.

BY H. ALLEYNE NICHOLSON, M.D., D.Sc., M.A., F.R.S.E., F.G.S., &c.,

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When groups of beds in different parts of the earth's surface, however widely separated from one another, contain the same fossils, or rather an assemblage of fossils in which many identical forms occur, they are ordinarily said to be "contemporaneous." That is to say, they are ordinarily supposed to belong to the same geological period, and to have been formed at the same time in the history of the earth. They would, therefore, be unhesitatingly regarded as "geological equivalents," and would be classed as Silurian, Devonian, Carboniferous, and so on. It is to be remembered, however, that it is not necessary to establish such a degree of equivalency between widely separated groups of strata, that the fossils of each should be to any great extent *specifically* identical. It is sufficient that, whilst some few species are identical in both, the majority of the fossils should be "representative forms," or, in other words, nearly allied species. It is the object, however, of the present paper to show that groups of strata presenting the same fossils, if widely removed from one another in point of distance, can only exceptionally be "contem-

poraneous" in the strict sense of this term. On the contrary, in so far as we can judge from the known facts of the present distribution of living beings, the recurrence of exactly the same fossils in beds far removed from one another is *prima facie* evidence that the strata are *not* exactly contemporaneous; but that they succeeded one another in point of time, though by no long interval geologically speaking.

Most of the facts bearing upon this question may be elicited by a consideration of such a widely extended and well-known formation as the Mountain Limestone or Sub-carboniferous Limestone. This formation occurs in localities as remote from one another as Europe, Central Asia, North America, South America, and Australia; and it is characterised by an assemblage of well-marked fossils, amongst which *Brachiopods* belonging to the genus *Producta* may be specially singled out. Now, if we believe that the Carboniferous Limestone in all these widely distant localities was strictly contemporaneous, we should be compelled to admit the existence of an ocean embracing all these points, and, in spite of its enormous extent, so uniform in temperature, depth, and the other conditions of marine life, that beings, either the same or very nearly the same, inhabited it from end to end. We can, however, point to no such uniformity of conditions and consequent uniformity of life over any such area at the present day; and we have, therefore, no right to assume that this is the true explanation of the facts. Indeed, this explanation would almost necessarily lead us to the now abandoned theory, that each period in geological history was characterised by a special group of organisms spreading over the whole globe, and that there took place at the close of each period a general destruction of all existing forms of life, and a fresh creation of the new forms characteristic of the next period.

In our inability, then, to accept this view, we must seek for some other explanation of the observed facts. The most probable view, and the one which is supported most strongly, both by what we see at the present day, and by what we learn from numerous examples in past time, is this:—The Carboniferous Limestone was not deposited all over the world in one given period, by one sea, or at exactly the same time; so that it can not be said to be strictly "contemporaneous" wherever it is found. This would imply a uniformity of

conditions over vast distances, such as exists no where at the present day, and such as we have no right to assume ever existed. On the contrary, the deposition of the Carboniferous Limestone must have first taken place in one comparatively limited area—say in Europe—where fitting conditions were present both for the animals which characterise it, and for the formation of beds of its peculiar mineral and physical characters. How wide this area may have been, signifies very little. It may have been as large as the area now covered by the Pacific, or larger, and yet it could not include all those localities in which strata of Carboniferous age with identical or representative fossils are already known to exist. At the close of the deposition of the Carboniferous Limestone in its original area, the conditions there present must be supposed to have become unsuitable for the further existence in that area of the assemblage of animals, which had been its inhabitants, or, at any rate, for a great many of them. The change from suitable to unsuitable conditions must, it is hardly necessary to say, have been an extremely slow and gradual one; and would doubtless be connected with the progressive shallowing of the sea, the diversion of old currents of heated water or the incoming of new currents of cold water, or other physical changes tending to alter the climatic conditions of the area. What, then, would be the result of such a change of conditions as we have supposed upon the animals inhabiting the area?

A. Some of them would, doubtless, be sufficiently hardy and accommodating as to bear up under the new state of things; and these would persist into the ensuing period, without any perceptible change, it might be, or more probably in the form of varieties or species allied to the old ones. In this case, therefore, we should get a certain number of species which would pass from the Carboniferous Limestone up into the Yoredale series, the Millstone-grit or the Coal-measures; or, if we did not find any species exactly the same in all these groups, we should still find in the later groups some forms which would be varieties of those of the older, or which would be allied or representative species.

B. There would, in the second place, be a certain number of species which would be utterly unable to withstand the altered conditions of the area; and these would gradually die out and become wholly extinct. We should thus get a certain number of fossils, which

would be either exclusively confined to the Carboniferous Limestone in general, or which, perhaps, might not be found out of the Carboniferous Limestone of a single region or even a single particular locality.

C. Lastly, some species would yield so far to the altered conditions of the area that they would "migrate," and seek elsewhere a more congenial home. This term is apt to convey false impressions; and it will be well here to consider what is meant by the "migration" of species or groups of animals. It is quite obvious that only animals like birds, fishes, mammals, insects, &c., which enjoy, when grown up, the power of active locomotion, can actually "migrate" in person, supposing they find themselves placed under unfavourable conditions. There are many animals, however, such as most shell-fish, corals, sea-urchins, &c., which have, when adult, either no power of changing their place, or at best a very limited one. Still in these cases even, though the *individual* has no means of removing its quarters to some more favoured spot, there may be a "migration" of the *species* from an unsuitable to a suitable locality. This is effected through the medium of the *young*, which have the power of choosing where they will settle, and are endowed with vigorous powers of locomotion. If, for example, a bed of oysters should become placed under conditions unsuitable for the development of these molluscs, it is clear that the old oysters cannot change their location. The young oysters, however, swim about freely, and these will move away from the original bed till they find a place which will suit them. By a repetition of this process there may be in course of time a removal or "migration" of a species for almost any distance, irrespective of the fact that the adult is permanently rooted.

To return, then, to the case which we have been considering:—when the conditions of life in the seas of the Carboniferous Limestone became unfavourable for the further existence of their fauna, some species would migrate to a more congenial area. In this way a greater or less number of the species characteristic of the Carboniferous Limestone, probably the greater number of them, would ultimately be transferred to another area. Here they would mingle with the forms already inhabiting that area, perhaps more or less completely supplanting these, perhaps merely succeeding in maintaining a precarious existence. In the course of their migration also, they would doubtless become more or less modified in their

character, so that, on reaching their new destination, some of them might be hardly recognisable as the same species. This would be further aided and increased by their having to compete with strange competitors. In any case, their remains would be preserved in the sedimentary rocks of the new area.

When, millions of years afterwards, we come to examine the earth's crust, and we find in two widely remote areas two series of strata containing certain identical and characteristic species, we naturally say: "These rocks are contemporaneous." It is clear, however, that if they had been formed in the manner we have been supposing, we should be wrong in this conclusion. The rocks in question would belong to the same geological period, and they would in part contain the same fossils; but they would belong to different stages of the same period, and they would not, therefore, be strictly "contemporaneous." To use a term applied by Professor Huxley to rocks believed to hold this relation to one another, they would be "homotaxeous" deposits.

What I have just said about the Carboniferous rocks would apply with equal justice to all the great formations, and to many of the smaller rock-groups all over the world. The Silurian rocks of Europe, North America, South America, Australia, &c., contain very similar fossils, and are undoubtedly "homotaxeous." Nothing, however, that we can see at the present day, would warrant us in believing that they are "contemporaneous," in the strict sense of this term. This is more especially the case with some of the minor subdivisions of the Silurian and Cambrian rocks, which have been shown to contain exactly the same fossils in parts of the world widely removed from one another. (For example, some of the peculiar Graptolites of the Quebec or Skiddaw series, are common to Canada, the north of England, and Australia.) The very closeness of the resemblance of the fossils, or the very identity of the species, is just what proves that the beds in question, from their geographical position, can not have been deposited exactly at the same time, though they doubtless belong to the same period, and may even be said to be related to one another by lineal descent. Similar remarks might be made about the Devonian, Permian, Triassic, Jurassic, Cretaceous, and other formations; but it is unnecessary to multiply examples.

If we take into consideration the converse of this, namely: how beds, which we know to be contemporaneous in the strict sense of the word, necessarily contain, in many cases, wholly different fossils, we shall be further convinced of the propriety of the views here advanced. If one could suddenly remove the sea from the earth, we should find at various points thus rendered accessible, deposits of different kinds, now concealed from us by the ocean, or only partially known by soundings or dredgings. Thus, where now rolls the Pacific Ocean, we should find vast accumulations of calcareous matter in the form of coral rock, and coral reefs. In high northern and in low southern latitudes, we should find great deposits of fine mud and sand, with angular blocks of stone; the whole derived from the great ice-fields of Arctic and Antarctic lands. Over wide areas, again, of the deep Atlantic, we should meet with an impalpable calcareous mud or "ooze." All these different deposits are obviously and necessarily "contemporaneous," not only in the loose geological acceptation of the word, but in its strictest sense. In spite of this fact *they would not contain the same fossils*, and indeed, they would be characterised by organic remains which would be wholly different in each case. The coral reefs of the Pacific would be mainly characterised by the abundance of the remains of corals, though they would also present the *exuviae* of other tropical forms of animals, especially Brachiopods and Echinoderms. The glacial mud of northern seas would contain the remains of arctic Molluscs, along with such other animals as delight in severe cold. Lastly, the "ooze" of the deep Atlantic would contain innumerable *Foraminifera*, along with siliceous sponges, sea-urchins, and Crinoids. We learn from this, therefore, that contemporaneous deposits not only do not necessarily contain the same fossils, but that, if widely separated geographically, they may be characterised by wholly dissimilar assemblages of organisms.

It may happen, again, as pointed out by Sir Charles Lyell, that deposits belonging to different geographical provinces may, as regards space, be extremely close together, and as regards time, may be actually contemporaneous, and yet may not contain any fossils in common, or only a very few. If, for example, any sudden upheaval were to lay bare what is now the floor of the Red Sea, together with that of the Mediterranean, we should find each to be occupied by

deposits absolutely synchronous as regards the time of their deposition, and very little removed from one another in actual distance, and yet containing, upon the whole, entirely distinct groups of organic remains. This arises from the fact that the marine faunæ of the Red Sea and Mediterranean belong to different zoological provinces; and the Isthmus of Suez constitutes an impassable obstacle to their inter-migration. We learn, therefore, from this, that owing to the existence of geographical barriers, it is possible for contemporaneous formations, to be found in close contiguity, in a single region, and yet to contain very different fossils.

We are now in a position very briefly to discuss the question of what may be called "geological continuity." As is well known, the entire series of sedimentary or fossiliferous rocks admits of a natural division into a certain number of definite rock-groups or "formations," each of which is characterised by a peculiar and distinctive assemblage of fossils, constituting the "life" of the "period," in which the formation was deposited. The older geologists held, what, perhaps, everyone would at first sight be tempted to think, that the close of each formation was signalised by a general destruction of all the forms of life characteristic of the period, and that the commencement of each new formation was accompanied by a creation of a number of new forms, destined to figure as the characteristic fossils of the same. This theory, however, not only invokes forces and processes which it can in no way account for, but overlooks the fact that most of the great formations were separated by lapses of time unrepresented by any deposition of rock, and yet as long or longer than the whole time occupied in the production of the formation itself. Indeed, we are compelled to admit that what we call the great "formations" are purely artificial divisions, rendered possible by the gaps in our knowledge only, and that if we had a complete series of rock-groups, we could have no such divisions.

Now-a-days, then, most geologists hold that there was no such sudden destruction of life at the close of each great geological epoch, and no such creation of fresh forms at the commencement of the ensuing period. On the contrary, they hold that there is a geological "continuity," such as we see in other departments of nature; and that the lines which we draw between the great formations merely mark periods of time, the rocks deposited in which are at present

unknown to us, or, it may be, have been subsequently destroyed by denudation.

We may arrive at some solution of this question by considering what we must believe to have occurred at the close of any great geological period—say the Cretaceous period. If we reject, as we must do, the belief that the close of the Cretaceous period was marked by a sudden and universal destruction and extinction of the Cretaceous forms of life, there is only one other view that we can accept. We know, from unmistakable physical evidence, that the close of the Cretaceous period in Europe was accompanied, or rather caused, by an upheaval of the Cretaceous area, and the obliteration of the Cretaceous sea, which must, at that time, have extended from southern Britain at least as far as the Crimea eastwards. As a matter of course, this upheaval was effected, not suddenly, but with extreme slowness, and it must have resulted in bringing about changes most seriously affecting the animals which swarmed in the Cretaceous ocean. At the commencement of the upheaval, as the sea gradually began to shallow, the marine animals would find their conditions of life changed; and as the upheaval went on, the state of things would become gradually worse, till finally, the area was converted into dry land. Some of the Cretaceous forms of life would, from the very beginning, be probably unable to accommodate themselves to the new *regime*, and these would die out. Some few would undergo no changes, but would simply migrate to a more favorable area. Many, lastly, would migrate, and in the process of migration, by reason of coming into contact with strange neighbours and untried conditions, would become gradually modified, till they might assume a form in which they would be regarded as distinct varieties or even distinct species. The ultimate result of the whole process would be the transference of many characteristic Cretaceous species to some sea more or less removed in point of distance from their original home. Not only so, but many of the transferred species might have undergone such modifications *in transitu* that they would now no longer be specifically identical with the forms of the chalk, but would be regarded as merely allied or representative species, though truly the lineal descendants of the Cretaceous animals.

It is perfectly clear that the process of rock deposition which was going on in Europe towards the close of the Cretaceous period was

not *abolished* by the elevation of the European Cretaceous area, but was simply *transferred* to some other region. In this particular case we do not happen to know where this new area of deposition may have been situated. It is quite certain, however, that in whatever area the Cretaceous animals of Europe took refuge, there rock must have been deposited in course of time, though it does not follow in any way that the rocks of the new area should have any likeness in mineral composition to those of the later Cretaceous period. If we should at any time discover these rocks, it may be pretty safely predicted what we should meet with in the way of fossils. We should find, namely, some characteristic Cretaceous species, but with certain points of difference; in addition there would be a certain proportion of forms of life wholly unknown in the Cretaceous rocks, and more or less resembling those of later periods; and, lastly, there would be a marked absence of certain characteristic species of the chalk. In other words, such deposits as we have been speaking of, would contain an assemblage of fossils more or less intermediate in character between those of the Cretaceous period and those of the lowest tertiary beds (Eocene) which rest upon the chalk. In point of fact, we have actually traces of such deposits (in the Mæstricht beds of Holland, the Pisolitic Limestone of France, the Faxoe Limestone of Denmark, and the Thanet Sands of Britain); and we find in these evident traces of such an intermixture of cretaceous with tertiary types.

It may be well here to consider for a moment how it is that we may never hope to find a complete series of deposits intermediate between any two great formations, such as the Cretaceous and Eocene rocks. In the first place, only a limited portion of the earth has as yet been properly examined, and we have therefore no right to wonder that we have not yet hit upon the area to which the process of rock forming may have been transferred at the close of the Cretaceous period in Europe. We have, however, every reason to expect that we shall ultimately find formations which will have to be intercalated in point of time between the white chalk and the Eocene rocks; and, as before said, traces of such are already known to us. Secondly, many of these intermediate deposits may have been destroyed at some time subsequent to their formation by "denudation." Thirdly, many of these missing deposits may have been

concealed since their formation by the deposition on them of other newer rocks; or they may be situated in areas which are at present hidden from us by the ocean. Fourthly, there may have been times in which great changes in life were actively progressing in areas in which there might be little or no contemporaneous deposition of rock.

From these and similar causes, it is almost certain that we shall never be able to point to a complete series of deposits linking one great geological period, such as the Cretaceous, to another, such as the Eocene. Still, we may well have a strong conviction that such deposits must exist, or must have at one time existed, though all traces of them may now be lost. Upon any theory of "evolution," at any rate, it is certain that there can be no break in the great series of stratified deposits, but that there must have been a complete "continuity" of life and of deposition, from the Laurentian period to the present day. There was and could have been no such continuity in any one given area; but it is not credible that the chain should ever have been snapped at one point, and taken up again at another wholly different one. The links may, indeed must, have been forged in different places; but the chain nevertheless remained unbroken. From this point of view, there would be little impropriety in saying that we are still living in the Silurian period; but we could say so in a very limited sense only. Most geologists probably would admit that there must in nature have been such an actual continuity of the great geological periods. Nevertheless it remains certain that we can never dispense with the division of the stratified series into definite rock-groups and life-periods. We can never hope to discover all of the lost links of the geological chain, and the great formations will ever be separated from one another by more or less pronounced physical or palæontological breaks or by both combined. The utmost we can at present do is to arrive at the conviction that the lines of demarcation between the great formations only mark gaps in our knowledge, and that there can be in nature no *hiatus* in the long series of fossiliferous deposits.

The theory, then, of geological "continuity" may in practice be carried so far as to be useless or even injurious to the progress of science. This would seem to be the case with a recent attempt by Professor Wyville Thomson to show that "we are still living in the

Cretaceous period," and that the "ooze" now forming at great depths in the North Atlantic is merely a continuation in time of the great and well-known deposit of the white chalk. The points of resemblance by which this is sought to be established, are these :—1. The Atlantic "ooze" is a whitish or grayish-looking mud containing about sixty per cent. of carbonate of lime, with from twenty to thirty per cent. of silica, and a variable quantity of alumina. When dry, and especially if consolidated, it would, therefore, approximate more or less closely in mineral composition and texture to white chalk. 2. The abyssal mud of the Atlantic is to a very large extent composed of the microscopic shells of *Foraminifera*, some of which are specifically identical with cretaceous forms; whilst, as shown by Mr. Lonsdale, the chalk is mainly composed of the *debris* of these minute organisms. 3. The Atlantic "ooze" contains numerous siliceous sponges, in many respects comparable with the sponges which are so characteristic of the Cretaceous period. 4. The Atlantic "ooze" contains numerous Echinoderms, epecially sea-urchins and Crinoids, such as abounded in the chalk period; whilst one of the latter is referable to a Cretaceous type, hitherto believed to be extinct. 5. We have reason to suppose that the conditions under which the white chalk was formed, were very similar to those now present in the Atlantic at great depths.

On the other hand, as pointed out by Sir Charles Lyell and Mr. Prestwich, the difference between the Atlantic ooze and the white chalk are, to say the least of it, quite as numerous and as weighty as the resemblances :—1. The white chalk differs to an important extent from the "ooze" in mineral composition; for it is composed of from at least eighty up to as much as ninety-nine per cent. of pure carbonate of lime. 2. Little stress can be laid upon the occurrence of identical species of *Foraminifera* in both deposits; for it is well known that such lowly-organized forms of life have an extraordinary power of persistence, surviving geological revolutions which are fatal to higher organisms. 3. The presence of some Cretaceous forms in the Atlantic ooze is far more than counterbalanced by the total absence of all those fossils which may be considered pre-eminently *the* fossils of the Cretaceous period; such as the various forms of *Cephalopoda*, especially the *Ammonitidae*, and the Bivalve Molluscs.

Mr. Prestwich, therefore, concludes that although it is probable

that "some considerable portion of the deep sea bed of the mid-Atlantic has continued submerged since the period of our chalk, and although the more adaptable forms of life may have been transmitted in unbroken succession through this channel, the immigration of other and more recent faunas may have so modified the old population, that the original chalk element is of no more importance than is the original British element in our own English people. As well might it have been said in the last century that we were living in the period of the early Britons, because their descendants and language still lingered in Cornwall, as, that we are living in the Cretaceous period, because a few Cretaceous forms still linger in the deep Atlantic. Period in geology must not be confounded with 'system' or 'formation.' The one is only relative, the other definite. A formation is deposited or takes place during a certain time; and that time is *the* period of *the* formation; but *a* geological period may include several formations, and is defined by the preponderance of certain orders, families, or genera, according to the extent of the period spoken of; and the passage of some of the forms into the next geological series does not carry the period with them, any more than would any particular historical epoch be delayed until the survivors of the preceding one had died out. Period is an arbitrary time division. The chalk on the 'London clay' formations mark definite stratigraphical divisions. We may speak of the period of the London clay, or we may speak of the Tertiary period. It merely refers to the 'time when' either were in course of construction. The occurrence of Triassic forms in the Jurassic series, of Oolitic forms in the Cretaceous series, and of Cretaceous forms in the Eocene, in no way lessens the independence of each series, although it may sometimes render it difficult to say where one series ceases and the other commences. The land and littoral faunas are necessarily more liable to change than the deep-sea fauna, because an island or part of a continent may be submerged and all on it destroyed, while the fauna of the adjacent ocean would survive; and as we cannot suppose the elevation of entire ocean beds at the same time, the maritime fauna of one period must be in part almost necessarily transmitted to the next."

In accordance, therefore, with the principles here laid down, we may conclude that it is not correct to say that we are "living in the

Cretaceous period," in any other sense than one might say, we are living in the Silurian period; with this difference only, that the Cretaceous period is much nearer to us in point of time than the Silurian, and that we can thus trace a relationship between certain living types and certain Cretaceous forms, such as we can not hope to establish in the case of Silurian fossils.

Lastly, it is to be observed that certain classes of animals are always likely to prevail under certain favouring conditions, wholly irrespective of any generic connexion between successive faunæ thus represented. Thus, the conditions present in the deep Atlantic are such as favour the existence of numerous *Foraminifera*, siliceous sponges, Echinoderms, and Brachiopods. Similar conditions existed in the seas in which the chalk was deposited, and we need not, therefore, be surprised that similar groups of organisms abounded in the cretaceous ocean. Similarly, there are portions of the incalculably older Carboniferous Limestone fairly comparable to the chalk in texture (making allowance for the vast difference of age), and containing forms of life, which may be regarded as representative of the Cretaceous fauna, such as *Foraminifera*, smooth *Terebratulæ*, and other Brachiopods, with Crinoids and sea-urchins. The conditions, however, present in the deep Atlantic cannot be exactly similar to those of the Cretaceous seas; for the *Cephalopoda* of the chalk seem to have no representatives in the abyssal mud of the Atlantic, whilst this class was well represented in Carboniferous times; so that there is, if anything, a closer genetic connexion between the chalk and the Carboniferous Limestone than between the chalk and the Atlantic "ooze."

THE COPTIC ELEMENT
IN LANGUAGES OF THE INDO-EUROPEAN FAMILY.

BY THE REV. JOHN CAMPBELL, M.A., TORONTO.

Read before the Canadian Institute, February 10th, 1872.

Professor Max Müller wisely holds that the classification of races and of languages should be quite independent of each other[1]. By this he means that the science of language in its classificatory stage and that of ethnology in the same should not be mixed up together by the student of both. He does not, and cannot, mean that we are not to expect to find intimate and important relations subsisting between the two classifications. If it be true that there are clearly defined species of mankind, it is exceedingly probable that there are corresponding clearly defined families of language. A multiplicity of protoplasts must, of necessity, imply various beginnings of speech. If again we favour the development theory in connection with the origin of the human race, we are almost compelled to adopt a similar theory in regard to the origin of language; and the classification, which proceeds upon subsequent development, will be as applicable to the one as to the other. Finally, supposing that theory to be the true one which finds in the human race no well marked species, but a number of varieties shading into one another by almost imperceptible differences, and defying anything like a scientific classification, may we not lawfully look for something of the same kind in the domain of that purely human faculty—speech? Professor Max Müller is a firm believer in the common origin of mankind, and has demonstrated the possibility of a common origin of language; yet he is disposed to draw very distinct lines between groups of languages, and to throw very far back into the past the time of their relative divergence from the simplest form of articulate speech.

Various attempts have been made to form a general classification of languages. Friedrich Schlegel divided them into two classes; the first of which "denotes the secondary intentions of meaning by an internal alteration of the sound of the root by inflection," and comprises the languages of the Indo-European family. The second, in-

[1] Lectures on the Science of Language; series 1, lecture viii.

cluding the Semitic tongues, "denotes the secondary intentions of meaning by the addition of a word, which may by itself signify plurality, past time, what is to be in the future, or other relative ideas of that kind." Bopp shows us that neither this division, nor that of Augustus Schlegel, into "languages without grammatical structure, languages that employ affixes, and languages with inflections," are valid, inasmuch as the inflections meant do not necessarily exist in, nor are characteristic of, the Indo-European languages, which represent the latter class. Bopp's own classification is into three classes. First, "languages with monosyllabic roots, without the capability of composition, and hence without organism, without grammar." This includes the Chinese. Secondly, "languages with monosyllabic roots, which are capable of combination, and obtain their organism and grammar nearly in this way alone." Here the Indo-European and so-called Turanian languages are found. Thirdly, "languages with dissyllabic verbal roots, and three necessary consonants as single vehicles of the fundamental meaning." The Semitic languages alone make up this class, "which produces its grammatical forms not simply by combination, but by a mere internal modification of the roots."[2] In this latter definition of his third class, Bopp falls into the opposite extreme to that for which he blames Friedrich and Augustus Schlegel. Internal modifications of the root are common to both the Semitic and Indo-European languages, and thus peculiar to neither. The best classification is that of Prof. Max Müller into languages in the Monosyllabic, Terminational, and Inflectional stages. The first still includes the Chinese; the second, in which one of the roots uniting to form a word loses its independence, embraces the Turanian languages; and the third, in which both of two roots uniting to form a word, lose their independence, contains the Indo-European and the Semitic families.[3] The author of this last classification, however, states "that it is impossible to imagine an Aryan language derived from a Semitic, or a Semitic from an Aryan language. The grammatical framework is totally distinct in these two families of speech." Ernest Renan goes much farther, and says, in his Histoire Générale et Système Comparé des Langues Semitiques, "We must give up the search for any connection between the grammatical systems of the

[2] A Comparative Grammar of the Sanscrit, Zend, &c., Languages, by Prof. F. Bopp. Translated from the German by E. B. Eastwick, F.R.S., &c. 2nd edition. London, 1856; vol. i, p. 99-103.

[3] Lectures on the Science of Language; series 1; lecture viii.

Shemitic languages and the Indo-European ones. They are two distinct and absolutely separate creations." An able writer in the *British and Foreign Evangelical Review* has shown, with some recent German philologists, that the grammatical differences here spoken of are greatly exaggerated. He proves that the mechanism of the Semitic verbs has so many points of similarity with that of the same parts of Aryan speech as to fail to constitute a fundamental difference between the two systems; that in the Celtic branch of the Indo-European family nouns are construed together as in the Semitic languages; and that there is a correspondence between the modes of inflection, internal and external to the root, in both groups which cannot be accidental.[4] It is important to notice the Celtic element which the *Reviewer* introduces, inasmuch as it has been generally overlooked in comparisons of the Aryan with the Semitic languages. The custom with philologists like M. Renan has been to compare typical or extreme representatives of each class, in order to justify their conclusion; thus the Hebrew and the Sanskrit have taken places which it would better have served the interests of truth to have given to the Punic or the Coptic and the Celtic tongues. Mr. Taylor professes, even from a comparison of the Hebrew and Greek and Latin languages, partly through the medium of the Gaelic, to be satisfied of the truth of the position "that, at the time when the Aryan and Shemitic linguistic families parted company, they were not only furnished with a good vocabulary of radical words, but possessed in germ, and in much more than infantile development, almost all the grammatical methods which are now so divided between them as to have led some philologists to describe the systems as entirely separate creations."

Passing from form to matter, from grammar to vocabulary, from inflections to roots, we find the Indo-European and Semitic families drawn still closer together. Professor Max Müller says, "the comparisons that have been instituted between the Semitic roots reduced to their simplest form, and the roots of the Aryan languages, have made it more than probable that the material elements with which they both started were originally the same."[5] Even Renan is constrained to admit "that the two families possess a considerable num-

[4] The Variation of Languages and Species, by the Rev. William Taylor; *British and Foreign Evangelical Review;* No. lxxviii; October, 1871.

[5] Lectures on the Science of Language; series 1, lecture viii.

ber of common roots outside of those which they have borrowed from one another in historic times."[6] It is on the ground of many radical words being the common property of the two families of language that many philologists, whose opinions Renan combats, have maintained their primeval unity. Some instances taken almost at random from the Hebrew lexicon, will suffice to show this identity of root in the Semitic and Aryan tongues:

Heb., HAKHAH or CHAKHAH; *Eng.*, hook; *Ger.*, haken; *Dutch*, haak; *Dan.*, hage.
Heb., HANAK or CHANAK; *Eng.*, hang; *Ger.*, henken; *Dutch*, hangen; *Dan.*, hoenge.
Heb., YALAL; *Eng.*, wail, howl, yell; *Gr.*, ololuzō; *Lat.*, ululo.
Heb., KHAPHAR; *Eng.*, cover; *Slavon*, kover;? *French and Romance*, couvrir, &c.
Heb., LAPID; *Eng.*, lamp; *Gr.*, lampas-ados.
Heb., LAKAT; *Eng.*, collect; *Lat.*, lectum.
Heb., LAKAK; *Eng.*, lick; *Gr.*, leichō; *Lat.*, lingo; *Ger.*, lecken.
Heb., AGABAH; *Eng.*, love; *Gr.*, agapē.
Heb., ATZAD or GATZAD; *Eng.*, adze, axe; *Gr.*, axinē; *Dan.*, oexe; *Ger.*, axt.
Heb., PARAD; *Eng.*, part, separate; *Lat.*, pars-tis.
Heb., KOL; *Eng.*, voice, call; *Gr.*, kaleō; *Sans.*, kal.
Heb., KEREN; *Eng.*, horn; *Lat.*, cornu; *Gaelic*, corn.
Heb., TZIPPOR; *Eng.*, sparrow; *Goth.*, sparwa; *Ger.*, sperling.
Heb., SHAKAPH; *Eng.*, look, see, scope; *Gr.*, skopeō.
Heb., SHARAK; *Eng.*, whistle; *Gr.*, surigx;? *Eng.*, shriek.

The mere casual survey of a lexicon of any of the Semitic tongues, Hebrew, Chaldee, Syriac or Arabic, must convince the unprejudiced student in philology how unjustifiable is the broad line of demarcation drawn between them and languages of the Indo-European stock.

Dr. Hyde Clarke, in a letter to the *Athenæum* of the 23rd of September last, cites a large number of Hebrew geographical names, with their phonetic equivalents in Greek and Latin. He says in conclusion, "I may state what I now know to be the fact, that the language of these names is Caucasian." Two statements of Sir Henry Rawlinson, in his essay on the Early History of Babylonia, merit attention in this connection. "There was not, perhaps, in the very earliest ages, that essential linguistic difference between Hamite and Semitic nations which would enable an enquirer at the present day, from a mere examination of their monumental records, to determine posi-

[6] Histoire Générale et Système Comparé des Langues Semitiques, par Ernest Renan, *vide* article of Rev. William Taylor, *British and Foreign Evangelical Review*. The position of the Shemitic nations in the History of Civilization, English translation, together with An Essay on the Age and Antiquity of the Book of Nabathæan Agriculture. London, 1862. Trübner, p. 116.

tively to which family certain races respectively belonged. Although, for example, the Hamite language of Babylon, in the use of post-positions and particles and pronominal suffixes, approaches to the character of a Scythic or Turanian rather than a Semitic tongue, yet a large portion of its vocabulary is absolutely identical with that which was afterwards continued in Assyrian, Hebrew, Arabic, and the cognate dialects; and the verbal formations, moreover, in Hamite Babylonian and in Semitic Assyrian exhibit in many respects the closest resemblances." "One of the most remarkable results arising from an analysis of the Hamite cuneiform alphabet, is the evidence of an Aryan element in the vocabulary of the very earliest period, thus showing, either that in that remote age there must have been an Aryan race dwelling on the Euphrates among the Hamite tribes, or that (as I myself think more probable) the distinction between Aryan, Semitic and Turanian tongues had not been developed when picture-writing was first used in Chaldea; but that the words then in use passed indifferently at a subsequent period, and under certain modifications, into the three great families among which the languages of the world were divided."[7] If we confine ourselves to the vocabulary, disregarding grammatical forms, it will not be difficult to prove the kinship of the whole race. Professor Müller quotes the statement of Dr. J. Rae, to the effect that all the Indo-European languages have their root and origin in that of Polynesia, a statement in which Dr. Rae is in part justified by the presence in many of the Malay dialects of roots identical in form and meaning with those of the Aryan languages.[8] Dr. Bleek thinks that the Kaffir and Hottentot languages, the latter of which is supposed to have old Coptic connections, are fitted to shed great light upon the most important problems of language in general;[9] and the Revs. H. M. Waddell, and Alex. Robb, missionaries in Old Calabar, find in the Efik, one of the Nigro-Hamitic tongues, a grammatical construction of Semitic form, and a vocabulary possessing radical affinities with the Nilo-Hamitic, Semitic and Indo-European families of speech.[10] I observe that Dr. Edkins, of Pekin,

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7 Rawlinson's Herodotus, App. Book i; essay vi; section 18.

8 Lectures on Science of Language; series ii, lecture i. Dr. Leyden long ago (*Asiatic Researches*, vol. x,) set forth the same truth, which modern theorists in language have rejected as interfering with their *a priori* conclusions.

9 Lectures on Science of Language; series ii; lecture i.

10 Twenty-nine years in the West Indies and Central Africa, by Rev. Hope Masterton Waddell; appendix vi. Notes on the Efik language.

has just prepared a work on Chinese philology, the aim of which is to prove the common origin of Asiatic and European languages.

In the above somewhat lengthy preface it has been my endeavour to show that, while important differences of grammatical structure do exist between certain groups of languages, these groups themselves cannot be clearly defined; and that even where points of similarity in grammatical structure are almost or entirely wanting, a community of roots may still attest true relationship. It is on these grounds, as well as on the ground of my belief already stated in a previous paper,[11] that Egypt was the cradle of the race, that I am emboldened to present, under the title of this essay, the result of some recent studies in comparative philology—studies which, I may state, were commenced and carried on in perfect independence of any theory.

The language in which I profess to have found a link or links binding together the Aryan and Semitic families, is the old Egyptian. The researches of M. Quatremère de Quincy first revealed the fact that this ancient language survived in the Coptic, which was used in Egypt as late as the twelfth century of the Christian era. After many foreign elements have been rejected from the Coptic, it is found to consist mainly of monosyllabic roots, many of them formed with only one consonant, and these apparently the radicals of Semitic words of similar signification. In the earliest stages of this language there does not appear to have been any well-marked distinction between the parts of speech, although, at a later period, a construction similar to that of the Semitic languages, especially in the case of the verb, manifests itself.[12] Professor Max Müller will hardly allow that the Coptic and Berber languages of North Africa are of a well-defined Semitic character; neither will he erect them into a separate family.[13] These languages, together with the Ethiopic, Nubian, Abyssinian and similar East African tongues, down to the old Malagasy, have been formed into a group called the Nilotic or Nilo-Hamitic, which Bunsen and others looked upon as sprung from the same stock as the Semitic, and as forming with them a single family. Sir Gardner Wilkinson makes the following interesting statements in regard to the old Coptic. "The Egyptian language might, from its grammar, appear to claim a Semitic origin, but it is not really one of that

[11] The Birthplace of Ancient Religions and Civilization.—*Canadian Journal*, August, 1871.

[12] Benfey, über das Verhältnisz der ägyptischen Sprache zum semitischen Sprachstamm. Leipzig, 1844.

[13] Science of Language; series i; lecture viii.

family, like the Arabic, Hebrew, and others; nor is it one of the languages of the Sanskritic family, though it shows a primitive affinity to the Sanskrit in certain points; and this has been accounted for by the Egyptians being an offset from the early undivided Asiatic stock, a conclusion consistent with the fact of their language being 'much less developed than the Semitic and Sanskritic, and yet admitting the principle of those inflections and radical formations, which we find developed, sometimes in one, sometimes in the other, of those great families.' Besides certain affinities with the Sanskrit, it has others with the Celtic, and the languages of Africa; and Dr. Ch. Meyer thinks that Celtic, 'in all its non-Sanskritic features, most strikingly corresponds with the old Egyptian.'"[14] Sir J. G. Wilkinson adds: "It is also the opinion of M. Müller that the Egyptian bears an affinity 'both to the Aryan and Semitic dialects,' from its having been an offset of the original Asiatic tongue, which was their common parent before this was broken up into the Turanian, Aryan and Semitic."[15]

From what has been said above, we need not be astonished to find instances of connection between the Egyptian language on the one hand, and the Semitic and Indo-European families of tongues on the other. First, in regard to the vocabulary, I may cite a few instances in which the names of persons, places and things are common to two or more of the languages compared. The poet Euripides represents Menelaus, a wanderer in the land of Egypt, as acquainted with such a correspondence.

"Πολλοὶ γὰρ, ὡς εἴξασιν, ἐν πολλῇ χθονὶ
"ὀνόματα ταὔτ' ἔχουσι, και πόλις πόλει
"γυνὴ γυναικί_τ.' οὐδεν οὖν θαυμαστέὸν."[16]

Among proper names of persons we have those of certain of the gods and goddesses:

Eg., Amun; *Heb.*, AMMON; *Gr.*, Haimōn.
Eg., Anouke; *Heb.*, HANOCH; *Gr.*, Anagkē, Ogka.
Eg., Anubis; *Heb.*, ANUB; *Gr.*, Oinopiōn, Oinops.
Eg., Athom; *Heb.*, ETHAM; *Gr.*, Athamas.
Eg., Athor; *Heb.*, ATARAH; *Gr.*, Aithrē.
Eg., Hekt; *Heb.*, JAHATH or JACHATH; *Gr.*, Hecatē.
Eg., Horus; *Heb.*, HORI; *Gr.*, Ōros,
Eg., Month; *Heb.*, MANAHATH; *Gr.*, Menoitios.

[14] Rawlinson's Herodotus, App. Book ii; chapter i.
[15] Rawlinson's Herodotus, App. Book ii; chapter i.
[16] Eurip. Helena, 497-499.

Eg., NEITH; *Heb.*, NAHATH; *Gr.*, Anaitis.
Eg., CHONS; *Heb.*, KENAZ; *Lat.*, Consus.[17]

The royal lists of Manetho and others furnish names that are the property not of Egypt alone but of the whole world. These names have received confirmation from the study of the Egyptian monuments. Such are MENES and ATHOTHES, corresponding to the German Mannus and Tait, the Welsh Menw, the Gallic Teutates, the Indian Menu and Greek Minos and the Phoenician Taautus and Hebrew Hathath or Jetheth. BOETHUS and CECHOUS are reproduced in the Indian Buddha and Okkaka, and in the Greek Bœotus and Ogyges. Okkaka, the *gourd*, answers exactly to the Coptic and Semitic *kus*, a word having the same meaning, and of which CECHOUS is a reduplicate form, as is well seen in the CHOOS of Eusebius. In CURUDES we find Gordys, Cretheus, and the common termination, *cartus;* in BIENNECHES the Greek Phœnix, and Indian Pingacsha; in TLAS, Atlas; in RATHURES, Erythrus of Greek, Roudra of Sanskrit, and Arthur of British mythology; in PACHNAN, the Persian Pecheng or Pushang, and the eponymus of *Pachynum* in Sicily; in TOTHMES, Teutamas of Assyria. Other names unite the Semitic and Indo-European languages, such as the following:

Eg., SIROIS; *Heb.*, SERAIAH; *Gr.*, Seirios; *Sans.*, Surya.
Eg., MARES; *Heb.*, MARESHAH; *Gr.*, Marsuas.
Eg., CHEBRON; *Eg.*, CEPHREN; *Heb.*, HEBRON; Septuagint, *Chebron*; *Gr.*, Kebrēn. Huperiōn.
Eg., SPANIUS; *Heb*, ISHPAN; *Gr.*, Hispania; *Pers.*, Isfahan.
Eg., ACHTHOES; *Eg.*, OTHOES; *Heb.*, JAHATH; JACHATH; Septuagint, *Jeth.*; *Gr.*, Aktaios, Aktaiōn. Attis, who is Papas.
Eg., ARCHLES; *Heb.*, AHARHEL; ACHARCHEL; *Gr.*, Hēraklēs; *Lat.*, Hercules.
Eg., RAMESES; *Heb.*, RAM; *Lat.*, Rome, Remus; *Sans.*, Rama.

We have the authority of Diodorus Siculus for locating the myth of Prometheus in Egypt and on the bank of the Nile.[18] On the Pelusiac branch of that river we find PHARBOETHUS, the modern HEURBAYT, which answers, *m* replacing its equivalent *b*, to the eighth old Egyptian month PHARMUTHI, which immediately preceded the season of inundation, with which Diodorus connects the myth of the

[17] The Hebrew equivalents of the above names and of others that follow, are almost exclusively derived from the first few chapters of the first book of Chronicles, where I am persuaded hat they do not designate the descendants of the patriarch Jacob. All attempts to turn the 2nd and 4th chapters into genealogies of the twelve tribes have failed.
[18] Diod. Sic. i, 19.

eagle. The later Coptic form of this word is BARAMOODEH, which at once calls to mind San Lucar de *Barrameda*, a Spanish town on the Guadalquiver, in which was an ancient temple of Phosphorus, who, like Prometheus, brought light from heaven.[19] Still another connection is found in the Indian Perimuda, mentioned by Aelian as a famous place for pearls.[20] In SETHRUM, ARCHANDROPOLIS, ANTAEOPOLIS, and ILITHYIA, appear Saturn, Archander, son of Phthius, the latter a name strongly resembling the Egyptian Phthah, Antaeus, son of Terra, and the goddess Ilithyia. In another paper I have called attention to THEBES, PHYLACE and TENTYRA as finding counterparts elsewhere. Mounts CASIUS and TOURRAH are reproduced in the Caucasus and Taurus of other lands. Aderbijan and Karugsar represent in Persia the Egyptian ATARBECHIS and CERCASORUM. CONOSSO gives Gnossus, TAHPENES Daphne, and ABYDOS is common to the Thebaide and the Troade. There was a BABYLON in Egypt, and a GOSHEN in Palestine; and the Minyae, before they dwelt in Greece, inhabited the wide Middle Egyptian District of MINIEH, and sojourned for a while about Khan Minyeh or Capernaum, on the sea of Galilee. Lofty Rome may owe its origin to those who once dwelt in Egyptian RAMESES, or Palestinian Rama, both of them meaning *the high or lifted up;* and its Romulus might easily pass from a Coptic RAMLIEH, on the east of the Nile, to an Arabic Ram-allah not far from Jerusalem, reproduced again in the Persian story as Roum, now Roumelia, in Turkey. The Palestinian Er Ram and the Egyptian HEROUM are one and the same, doubtless connecting with the Armenian Erzeroum. ATTIKEH *prius* FOSTAT, *Fastu* or *Astu*, where Cairo now is, must not be altogether disconnected from the Indian region of Attock, the Palestinian Athach, and the Greek state, Attica. From a very early period the Arabs were familiar with the name of the Egyptian town ATHRIBIS, as applied to their own Yathrib, and the Greeks of Oeta and Parnassus in vain attempted, by means of *drus*, the *oak*, and *ops*, a *voice*, to turn their form Dryopis into the original of the Laureate's "Babbler in the land," the Talking Oak.

Turning from names of places to those of things, the old Egyptian word, UK, presents itself as intimately related to our Saxon equivalent, *week*. CHRB is the name of the rolling beetle, which encloses its eggs in a ball of manure and earth, and rolls this ball sometimes

[19] Strab. ; l. iii ; c. i ; § 9.

[20] Aeliani de Animal. xv, 8.

great distances to a hole prepared for or fit to receive it.[20*] We at once detect in it the Greek *karabos* and the Latin *scarabaeus*, from which comes the French *escarbot;* nor are we astonished to find that the Sanskrit for locust is *carabha*, since the locust belongs to a natural order of insects closely related to that in which the beetles are found. The Hebrew equivalent of CHRB, however, is the word AKRAB, with which the Arabic agrees in form and sound, and which designates the scorpion and a warlike engine named from it. With this word Gesenius rightly connects the Greek *scorpios, the scorpion*, which, according to Liddell and Scott, who quote Hesychius upon the subject, is from the same root as *skarabos, karabos*, coming through *skorobaios*, and also denotes an engine of war. The Greek *karabos* not only denotes the beetle, but also the *crab*, which we find in the French *écrevisse* and the German *Krebs*. LABOI, *the lion*, is the original of the Hebrew LABI and the German Löwe; THMEI, truth, is the Hebrew THOM and the Greek *Themis*. IOH is Coptic for *moon*, and we find *Io* as a name of the same luminary in Argos. ERMAN, *pomegranate*, IERO, *stream*, LAS, *tongue*, SES, *horse or mare*, SHMOUN, *eight*, are almost identical in form with the Hebrew words denoting the same thing. Other words, such as MAUT, *mother*, ME, *love*, MEN, *establish*, ORK, *swear*, RRO, *king*, TEI, *give*, exhibit manifest connection with both Semitic and Indo-European languages.

These examples are, I think, sufficient to show that the old Egyptian, as far as its vocabulary is concerned, stood in the relation either of borrower from, or lender to, two families of language, to neither of which it has been generally supposed to belong. I propose to show, however, that the Indo-European tongues, and probably the Semitic, borrowed from the old Egyptian, by reference not so much to the vocabularies of these languages, as to a feature which can only be explained by the grammar of the Coptic. The Coptic definite article masculine is *p* or *ph*, and in the Egyptian language is closely bound up with many words to which it had been prefixed, and from which it has not been distinguished and separated by those who have transplanted such words to other soils.[21] We must expect to find the

[20*] Osburn, Monumental History of Egypt, i, 205. Cuvier, Le Règne Animal, Paris, 1817, tome iii, 277. Carpenter's Zoology. Bohn, ii, 127.

[21] The sign of the masculine article is Theban *pe, p*, Memphitic *pi, p, ph*, and Baschmuric, *pe, pi, p*. It is derived from the pronominal suffix of the third person singular masculine, which is *f*, the Coptic *fei*. This sometimes assumes the form of *b* or *vida*.—Peyron. *Gram. Ling. Copt.;* Benfey, *die ägyptische Sprache.*

Coptic article in all the various forms through which the *p* sound is seen to pass in etymology, as *p*, *ph*, *f*, *b*, *v*. The Bible and Herodotus present us with two examples of the use of this article. The town called by the Greeks Bubastis, is sacred to the goddess BASHT or PASHT, and is rendered in Ezekiel xxx, 17, PI-BESETH or PI-PASHT. Herodotus, in the 143rd chapter of his second book, states that the Egyptian word PIROMIS means *a man*, noble and good, or a gentleman. Now, ROME is the Coptic for man, and PI the definite article. Similar examples are found in PI-THOUM, PA-CHONS or BE-SHENS, PH-AMENOPH, PI-LAKH, PH-RE. PAPREMIS is P-IBRIM, and FAYOUM is PI-YOM. A learned writer is of the opinion that PIROMIS and and Brahma, as denoting original and absolute man, are the same word.[22] I have little doubt that PIROMIS, or else PIRAMA, the mountain, hence pyramid, is the original of the Latin *primus*, which shows its true root in the Scythian *arima*.[23] The Coptic PHRE, a solar god, is transported, article and all, into the Scandinavian mythology, where he becomes Frey, the symbol of the sun.[24] Still another example of the migration of the Coptic article is found in Bambyce, a town in Syria of which Strabo speaks.[25] Pliny mentions the same town not only as Bambyx, but also as Mabog.[26] Now, the latter half of this name is identical with the word BEK or BAKI, the Coptic for town, found in ATARBECHIS, in Egypt, and also in BAALBEC, another Syrian city. The *b* which is kept by the Greek geographer, and discarded by the Latin, is undoubtedly the same element as that which changes the Egyptian ISEUM or HEBAIT into BEBAIT, and this is the Coptic article. There are even Coptic roots that may be supposed to show the very originals of language, which, with the addition of the article, have passed into other tongues, and in these are regarded as radicals themselves. Thus EIT, a *house*, which is the same as the Welsh *ty*, and Gaelic *tigh*, or better still the German *Hütte*, and our English *hut*, becomes the Assyrian BIT, the Arabic BEIT, the Hebrew BETH, the Erse *both*, and thus the well-known words *booth* and *bothy*. NUM, *spirit*, is the Greek *pneuma*; TAU, *life*, appears in the Latin *vita*, which is the Gaelic and Erse *beatha*, and the Welsh *bywyd*; and MEN, a shepherd, after receiving an initial vowel, passes into the Greek *poimēn*. By means of this part of speech, presupposing of

[22] Guigniaut, Religions de l'antiquité; Tom. i, 823.
[23] Herodot. iv., 27.
[24] Mallet's Northern Antiquities, Bohn, 110, 551.
[25] Strab., xvi, 1, 27.
[26] Plinii Nat. Hist. v, 19.

course an Egyptian connection, a simple explanation, otherwise impossible, can be given of the once extensive use of the Aeolic digamma, which at a later period passed out of the Greek language; of the *v* which took its place in Latin, although even here a Sabine form in *f*, that did not find its way into classical Latinity, may with equal or greater force claim to be its representative; and of the *p*, which so commonly in German, but so rarely in Danish or Dutch, precedes a root beginning with *f*, e.g., Pfad, Pferd, Pflanz, &c. To the Coptic element in language must also be referred what has been called the Cretan aspirate, which makes *polchos* out of olchos, a word supposed to be identical with *vulgus* and *folk*. We can thus at once account for the double form which the same word sometimes presents, and for the similar forms of two words closely allied in meaning, in the same language. In Greek I may cite the proper names *Peisandros* or *Isandros*, the son of Bellerophon; *Periboia* or *Eriboia*, wife of Telamon; *Halisarna* in Mysia and the island of Cos, and *Phalasarna* in Crete; *Iakchos* and *Bakchos*, *Heōsphoros* and *Phōsphoros*, as also the common names *ortux* and *perdix*, of which an intermediate form is the Sanskrit *vartika; sittakos* and *psittakos*, the parrot; and probably, *astēr* and *phōstēr*. Latin presents us as examples with *Isaurus* and *Pisaurus; Raetavi* and *Praetavi; Vesper* and *Hesperus; vitulus* and *Italus; pinguis* and *unguen:* in the Sabine form above mentioned with *hœdus* and *fedus, hircus* and *fircus, hordeum* and *fordeum;* and also with instances of verbs which, doubtless, assumed the article in the substantive form, from which, in spite of Oriental grammarians, I believe the verb to have been derived, such as *uro* and *buro*, *actum* and *factum*. Other languages present the same phenomenon. Sanchoniatho's Phœnician fragment speaks of *Sidon* and *Poseidon* as children of Pontus; the Sarmatian deities *Lebus* and *Polebus* are but one; and Scandinavian mythology preserves the name of the first of the giants as *Orgelmir* and as *Bergelmir*. The Irish *atha* and *fatha* equally denote a lawn or plain; and the English *eat* and *bite* correspond to the German *essen* and *beissen*. We borrow *brim* from the Saxon and *rim* from the Welsh; and it is universally allowed that *lump, clump, plump*, are all variations of the same root.

I am inclined to believe that the Coptic root is nearer that of the original language than the Hebrew or any other Semitic tongue, and that we may find in the latter, as already indicated in the example BETH, instances of the transference of the Coptic article along with

the original root. The Assyrian BILU consists undoubtedly of the well-known ILU, the name of the supreme god of Babylonia, and thus of all deities, and a softened form of the Coptic article. The analogy of EIT and BIT would aid in coming to this conclusion; but stronger evidence for the truth of it is furnished by the Hebrew. In that language the name of the Most High God is AL, while the word corresponding to BILU, meaning *lord*, and applied to neighbouring gods, is BAAL. In parts of Arabia, strange to say, the article seems to have been, at least for a time, knowingly retained, although the Arabic *al* or Himyaritic *ka* were at hand to supplant it. Thus, we find Pliny, about the 70th year of the Christian era, mentioning the Thimanei,[28] an inland people of the peninsula; while Agatharchides, who wrote more than two hundred years earlier, described them as the Buthemanei.[28] Still, it is to the Indo-European languages that we must chiefly look for traces of this venerable prefix. A Semitic root meaning strong, and, in a secondary sense, fortified, is SHADAD, SHEDID. Hence came the Hebrew, or rather Philistine, word ASHDOD, which is the same as the name given to Egyptian Babylon, FOSTAT. Although the Pishdadian line of Persia has been supposed by many to owe its name to a root of similar form denoting *justice*, there is much reason to believe that "the good old rule" of their time may have developed justice out of strength. At any rate there is little doubt that the Coptic article is as much part of the name Pishdad, which Hushang first bore, as it is of his other Persian name Pushang, which the Arabs harden into Fushang. Old Greek dropped the reduplicated *t* of the Egyptian FOSTAT in *Fastu*, the Homeric form of *Astu, the city*, which we have the authority of Didorus Siculus for connecting with the Egyptian town.[29] From this old word, originally meaning *the strong* or *the fortified*, and thence, by syntactical convertibility *the strong and fortified place*, such as all cities were in ancient times, have come, through different channels, our English words *state* and *city*. The former we owe, not to the Latin *status*, but to the German *Stadt;* and the latter comes doubtless from a simpler form of the Latin *civitas* such as we find in the Spanish *ciudad*, or better still the Portuguese *Cidade*, a word as like the old ASHDOD as we may reasonably expect so modern a term to resemble so ancient a one. It is interesting to note that

[27] Id. vi., 32.

[28] Agatharchides, de Mare Rubro, Hudson, 57, &c.

[29] Diod. Sic. i., 16. Vide et. Strab. i., ix., 15.

while the examples given of the presence of this root in the Indo-European tongues are, with the exception of the Aeolic *Fastu*, destitute of the article, we find that prefix in the German *Feste*, meaning *strength* and *a strong place* or *fortress*, whence comes our English word *fastness*, a stronghold. It is also found in the languages of India whether we regard the old form *vastu* or the modern Hindustani *basti*, a village. The horse and his near relations seem also to show even in some of the Semitic words which stand for them, as well as in those of Indo-European tongues, traces of the Coptic article. The wild ass is called in Hebrew ARAD, but PERED in the same language denotes a mule. The first of these gives the Sanscrit *arvat*, and the second the Dutch *paard*, or with the article reduplicated, the German *pferd*, both meaning *a horse*. The Arabic and Persian FARAS, and the Hebrew PARASH, the name of the horse proper, look back to an older root RAASH, applied in several places in the book of Job to the actions of the noble animal which the inspired writer so well describes,[30] from which root the German *Ross* and our English *horse* may have been derived. EIL, the Hebrew for *foal* is the ancestor of our English word, which might equally be derived from the Greek *pōlos*, the Latin *pullus* or the Saxon *fole*. A word somewhat similar in sound is ALEH, denoting *leaf* or *foliage* in the language of the Old Testament, and giving us the original of the Erse *billeog*, the Greek *phullon* and the Latin *folium*. Still another instance, making with the two last mentioned a threefold cord not easily broken, is that of the Hebrew root YAAL, to be *foolish*, with the derived EVIL, a *fool*, which, besides our English word, accounts for the Irish *bille*, and the Welsh *ffwl*. Almost every one who has taken even a passing glance at etymology is familiar with the widespread character of the root of our English word *wine*. The Coptic for wine is *erp*, a double root, doubtless allied to the Hebrew ARAB or GHARAB, *to be sweet or agreeable*, to the Persian *sherab*, *wine*, to our English word *grape*, and to the German *Rebe*, the *vine*, and *Traube*, the *grape*. But the most common root is that which the Hebrew gives as YAIN, a word almost identical with the Greek *oinos*, to which the Armenian *gini* and the Welsh *gwyn* approach. The old Greek form *foinos* is almost reproduced in the Irish and Gaelic *fhion*, that passes through the Latin *vinum* into the German *Wein*, from which our eclectic

[30] Job xxxix., 20, 24; xli., 21.

English language has taken not only *wine* but *vine*, the equivalent of *Rebe*.[31] Almost as universal is the old root which appears in the Hebrew as YADA, perceive or know; in the Greek, with the same signification, as *eido*, *oida*; and in the Welsh as *gwyddoni*, to gather knowledge. The Homeric form with the digamma turns *eido* into the Latin *video*, the Danish *vide*, the Dutch *weet*, our English *wit* and *wot*, and still more distinctly, into the Sanskrit *budh*.[31] Another verbal root is the Hebrew HALAK, *walk* or *follow*. The two words which indicate its meaning in English are derived from it. The first of these requires no explanation; the second comes through the German *folgen* or the Dutch *volgen*. Still further examples of a verbal root with the prefix are afforded in RAAM, *resound, roar as the sea, thunder*; RAA or RAGAG, *break*, and RATZATZ, *bruise, burst*; the first of which gives us the Greek *bremo* and the Latin *fremo*; the second (the Hebrew ע having for its equivalent the Greek γ) the German *brechen*, the Greek *rēgnumi*, and the Latin *frango, fregi*; and the last, the Latin *presso*, the French *briser* and the English *bruise*.[31] Similarly the Hebrew LAKAH or LAKACH, *take* or *seize*, which in Swedish assumes the form *luka* with the slightly altered signification to draw, connecting with the German *locken*, to entice, becomes the word pluck, common to the Germanic languages.[31] The last examples from a similar verbal root which I shall present are the Latin *positus* and English *post*, which, equally with the Latin *sto*, the Greek *histēmi*, the German *sitzen*, the English *set*, and the Welsh *gosod*, may trace their origin to the two Hebrew forms YASAD and SHITH, *set, placed, established*.

Among nouns the Hebrew APHAL, *swell*, and hence *tumour*, becomes the Latin *papilla* and *papula*, whence our *pimple*; ESHCOL, a *cluster*, is the Latin *fasciculus*; LAHEM, *war*, gives us the Greek *polemos* and the Latin *Bellum*; ZEBUB, *fly* or *bee*, furnishes the Latin *vespa* and our *wasp*. The Hebrew UR, *fire*, is identical with the Armenian *hur* and shows itself in the Latin *uro*, but is also the same word as the Greek *pur* and the German *feuer*. One of the words for *city* in the same language is AR, which is rendered in the old Persian by *var*,[32] and in the Sanskrit by *pur*. Prithivi is Sanskrit for the *earth* and resembles the Welsh *pridd* meaning the same thing. Remove the Coptic article and our English *earth* and its

[31] *Vide* Gesenius' Hebrew and Chaldee Lexicon, notes *in loc.*

[32] Var Djemschid, the enclosure or town of Djemschid.

German relative *erd* remain, both of which come from the Hebrew ERETZ. The Irish *pluc*, the *cheek*, can at once be referred to the Hebrew LECHI; and the Persian *bez*, a *goat*, and *bezer*, *seed*, to EZ and ZERA in the same language, the latter word being connected with the Latin *sero*. As the borrowing of the Latin betrays itself by the presence of the Coptic article in the Romance languages, so the borrowing of the Sanskrit appears in the Hindustani dialects. *Admi*, a man, *ma*, a mother and *beti* a daughter are so like the Arabic ADEM, UM and BINT (Heb. BATH) that they must have come directly from some such Semitic source; but *bap*, a father and *bhai*, a brother, must have picked up the *b* which precedes the AB and AH or ACH (Arab. AKH) of the Hebrew during an older period than that of the Hindustani.

It is not to be supposed that in every case in which we find the same root with and without the prefix *p*, *ph*, *b*, *v*, in the same or different languages we are to conclude necessarily that we have to deal with the Coptic article. A very common German verbal prefix *be*, as in *bedecken*, *bedenken*, *befehlen*, is an inseparable intensative particle, while *ab* and *bei* as in *abschneiden*, *beifügen*, are separable particles with ablative and dative powers. Either of these particles might readily be mistaken for the article. Another interesting case in which the same error might happen is that of the word with which our Hebrew scriptures begin, BRESHITH. There is no doubt whatever that this word is the original of our English *first*, which ignorant etymologists have derived from a superlative form of the Anglo Saxon *feor*, far. The Danish *först*, while agreeing with our English ordinal, shows how mistaken is such an etymology, and the Dutch *eerst* and German *erst* make it still more apparent by the absence of the initial *f*. The Dutch and German forms present us with the Hebrew original RESHITH, the *first* or *beginning*, the *b* which is replaced in Danish and English by *f* being the preposition *in*. Although this example is introduced as a beacon to warn against an indiscriminating reference of all initial *p* and *b* sounds to a Coptic original, I may be permitted to say in passing that both Theology and Geology would be gainers were the literal "First" to replace "In the beginning" at the commencement of our English version of the Bible.

It is doubtful whether the Armenian *hink*, the numeral five, as contrasted with the *pancha*, *penj*, *panch*, *pianch*, *penc*, &c., of the

Sanskrit and other Oriental languages of the Indo European family, is to be regarded as the root without the article or as the corruption of an early form beginning with *p*, inclining towards the *quinque* of the Latin. In the majority of cases that have come under my notice in which *p* and *k* sounds replaced each other in the beginning of words or rather of syllables or roots, I have been able to account for the transformation by reference to the Semitic form of the root. This I have found almost invariably to begin with such letters as the Hebrew ה, ח and ע, the first two of which are represented by the Arabic *hha* and *kha*, and the last by *ain* and *ghain*. Our English translation of the Bible, like the Septuagint version, varies in its rendition of these letters as they occur in proper names. Generally, however, it gives the softer sound, even where the Septuagint is hard. Thus חברון is made Hebron while the Septuagint is *Chebrōn* and יעבץ sinks the ayin in Jabez while the Greek version reads *Igabes*.[33] In the passage of Hebrew words through other languages this disagreement and inconsistency holds good ; sometimes we find the letters mentioned represented by simple vowels and sometimes by aspirates and gutturals even to the hardest of hard *k checks*. When the Coptic article has been prefixed to a root of this kind the power of the aspirate is either lost altogether or else it is absorbed in the prefix, which assumes the form of *ph, f, v*. When the article is not prefixed, the guttural sounds of ח and ע remain, or are exaggerated into those of k and g, or become softened into that of s: e. g. Phanuphis and Canopus from the root ענוב. I must admit, however, that there are many cases which cannot be explained in this way, and among these that of the numeral *five* is one. It would not be difficult to connect the first part of the Hebrew, Syriac and Arabic HAMESH or CHAMSAH, the Ostiak *chajem*, the Siamese, Thibetan, Chinese and Burmese *cha, gna, ong, ngah* with the Armenian *hinc* and the Latin *quinque*, since *m* and *n* are interchangeable, and it is as possible for final *s* to be hardened as for the *k* sound to be softened. Dropping the *k* sound and prefixing the Coptic article, we might embrace the Scandinavian *fem* and *fimm*, the Sanskrit *pancha* and the Persian *penj ;* but the Æolic *pempe*, the Welsh *pump*, the Maesogothic *fimf* and the modern German *fünf*, by means of their final *p* or *f*, almost threaten with destruction the whole theory of the Coptic article, more especially as we find that termin-

[33] 1 Chron. ii. 42, 43, iv. 9, 10.

ation even where the radical *m* or *n* is missing, as in the Anglo-Saxon, *fif*, the Frisian *fyf*, the Dutch *vijf* and our English *five*, which follow the analogy of the Gaelic and Irish *coig* and *cuig*. The Coptic five, TOU, cannot help us here. Such cases, however, are no more to be accepted as offering opposing testimony to those which vouch for the truth of the general principle here illustrated than were the Irish criminal's ten witnesses, who sought to negative the evidence of ten men that had seen him commit the crime for which he was being tried by stating that they had not.

Without referring to Semitic roots I may instance some additional examples among Indo-European words of the presence of the Coptic article. The Sanskrit *udan*, the Greek *hudor*, the Gaelic and Irish *ad*, signifying *water*, have thrown off what the old Phrygian retained in *bedu* and the Slavonic in *voda*. Another Sanskrit word *pavaka*, fire, on the other hand retained the article, while the Latin *focus* and the Gothic *bac* rejected it; but the Sanskrit *urana*, goat, becomes the Lithuanian *baronas*, as the Greek *rhigos* and *oregō* are transformed into the Latin *frigus* and *porrigo*. Bopp is quite right when he says "the Latin Rog (rogo, interrogo) appears to be abbreviated from Frog."[34] This is seen in the Sanskrit *prach* and the German *fragen* both meaning *to ask*. Another instance in which the Sanskrit shows an affinity with the Aeolic and Sabine dialects of Greek and Latin is afforded by the word *pum*, a man, the Latin *homo*. The Welsh *oer* and the Gaelic and Irish *fuar*, cold, the Greek *phrēn* and the Latin *renes*, the English *rap* and the French *frapper*, the Greek *husteros* and the Latin *posterus*, the Welsh *oes* and the Greek *bios*, the English *order* and the German *fordern*, completely set at nought every law of phonetic change forming part of the physical science of language in the attempt made by such means to account for their differences. The science of language has a place among the historical as well as among the physical sciences; and its historical element is as distinct from the physical as are the objects of Palæontological from those of Mineralogical study, the fossils from the mere strata in which they are imbedded. Following out the analogy, we may compare the subjects of our present philological researches to the Crinoids of many formations, some of which are still attached, or may we not say articulated, to the old Coptic foundation, while others, that once occupied the same position, have floated free, and

[34] Bopp's Comparative Grammar, i., 116.

are now found under the conditions of an earlier stage of existence. In such a free state we find the Latin *latus*, broad, with the Welsh *llydau*, the Gaelic *leud* and the Irish *lead*, while the Greek *platus*, the German *platt*, the Dutch *plat*, the Danish *flad* and our English *flat* remain fixed by the old Coptic stem. The same relation between the Greek and the Celtic languages subsists in the case of a word for *ship*, which is *ploion* in Greek, but *llong* in Welsh and *long* in Gaelic and Erse. A still more familiar example is that of the Gaelic and Erse *athair* as compared with the Greek and Latin *pater* and our English *father*. The order of relation is, however, inverted in the word denoting anger; this being *orgē* in Greek, but *fearg* in Gaelic and Erse and *froch* in Welsh. Nor do we find the Celtic tongues agreeing among themselves, for while the Welsh *pysg* accords with the Latin *piscis*, the Germanic *Fisch* and our English *fish*, the Gaelic *iasg* and the Irish *iasc* have divested themselves of the prefix and appear in a form nearer to that of the original word. The root of our English *flame* is not easily recognized under the various forms it assumes in different languages nearly related to each other. In Coptic it is LOBSH, in Hebrew LAHAB, the same in Æthiopic, and in Arabic LEHIB. The *b* of the Semitic form becomes *m* by one of the commonest of all processes in language, exemplified in the change of the Hebrew name of a town of the Philistines, JABNEH, to the Greek *Iamnia* or *Iamneia*. Thus the LOBSH, LAHAB, LEHIB, of the Coptic and Semitic are transformed into the old Saxon *leoma* and the Celtic *laom*, the broad *o* of the Coptic reasserting itself and taking the place of the Hebrew and Arabic aspirates. In the Gothic, however, the final *b* or *m* is dropped, and the aspirate in consequence acquires additional power, LAHAB becoming *log*, a word presenting much resemblance to the Latin *lux*. To this the article is prefixed in Greek, and *phlox* appears, in Romaic *phloga*. But, meanwhile, the final *m* has not been lost sight of, for, in the same language, *phlegma* displays the full proportions of the word. The Latin accepts the prefix but rejects the aspirate in *flamma*. While, however, the later Germanic tongues restore the article, which Gothic and old Saxon had discarded, as in *flamme* and *vlam*, the Spanish, daughter of the Latin, reverses the process, and, although she still recognizes *flama* in her vocabulary, makes use more frequently of the form *llama*. Finally, to show yet more clearly the relation of the hard *g* of Gothic and Greek to the root,

we find the Danish *lue*, the German *lohe* and the Lowland Scotch *low* reproducing what I believe must have been the original word meaning *flame*. The English word *flagon* which is *flacon* in French, *lagēnos* in Greek and *lagena* in Latin, may doubtless be referred to the Hebrew LOG, a liquid measure containing over twenty-four cubic inches. Varro informs us that the Ionians called *ear* the spring, *bĕr*,[36] which is nearer to the Persian *behar* than the Latin *ver*, and may not improbably connect with the Erse and Gaelic *ur* and *feur* meaning *green* and *grass*. Professor Müller says, "Beech is the Gothic *boka*, Latin *fagus*, Old High German *puocha*. The Greek *phēgos*, which is identically the same word, does not mean beech but oak. Was this change of meaning accidental, or were there circumstances by which it can be explained? Was *phēgos* originally the name of the oak, meaning the food-tree from *phagein* to eat? And was the name which originally belonged to the oak (the Quercus Esculus) transferred to the beech, after the age of stone with its fir trees, and the age of bronze with its oak trees had passed away, and the age of iron and of beech trees had dawned on the shores of Europe!"[37] No doubt the author of these words is right in his conjecture, which he hardly dares to take out of the category of hypotheses. The Danish *eeg* is the Greek *phēgos;* the German *eich* is its own *buch* and the English *beech;* while English *oak* and Dutch *eik* represent the Gothic *boka*. These are variations of an old root that must have stood for tree in general, just as we find the words EIL, ELON in Hebrew standing for an oak, a terebinth or any conspicuous tree, and THOR the Coptic and *drus* the Greek *oak* as forms of a root that furnishes the Germanic, Celtic and Sclavonic languages with the equivalent of our English *tree*.

One of the most striking instances of a double or even treble phonetic change in the passage of a root through various languages is afforded in the word *god*. I regret that in setting this forth it will be necessary to come into conflict with the views of one who is universally recognized *facile princeps* among philologists, and a high authority in oriental literature. I allude to Professor Müller, who speaks most condemningly of Sir William Jones, because "he actually expressed his belief that Buddha was the same as the

[36] Varronis de lingua Latina, l.v.

[37] Science of Language, Series ii. Lect. v.

Teutonic deity Wodan or Odin."[38] Professor Müller is aware that Sir William Jones was not alone in this belief; but that, together with other orientalists, a large number of northern European mythologists, and among them, some who possessed far greater opportunities of judging in the matter than Sir William Jones, have homologated the opinion of that distinguished father of Eastern learning. I have looked into some, and carefully studied other works to which Professor Müller refers the student of Buddhism, such as the Rev. Spence Hardy's Manual; and although such studies have left me in doubt as to the time when the Buddhist system was fully organized, they have confirmed me in the belief that away in the distant past, long before that period of development, there lived a Gotama Buddha, who is identical with the German and Scandinavian Odin. At present, however, we are not dealing with mythology, but with that language of which Professor Müller fancifully calls it a disease. The same writer says truly "God was most likely an old heathen name of the Deity."[39] Now we are acquainted with the old heathen names of the Deity among the northern peoples who make use of this word; and the nearest to it of these names is that of the Lombard and Westphalian *Guodan*.[39*] In the Germanic languages the name appears in such forms as to show either that the initial *g* is not an essential part of the root, or that it marks the original presence of a letter similar to the Hebrew ע, which might be retained as a broad vowel, a simple breathing, or a guttural. I hold to the latter opinion, and find the rendering by the broad vowel in Odin, Oden, Oðinn of the Scandinavian. Grimm connects Gwydion, son of Don, of the Welsh mythology[40] with Odin, making them the same person. It is hard to distinguish this personage from Æddon, who is Buddwas, and who came originally from the region of Gwydion.[41] Æddon presents us with the same form of the root as Odin, while Gwydion is guttural, like Guodan. The prefix of

[38] Chips from a German Workshop, Vol. i., Art. ix., on Buddhism, Art. xi., Letter on the Meaning of Nirvana.

[39] Science of Languages, Series ii., Lect. vi.

[39*] In Florence of Worcester's Chronicle, A.D. 849, it is said of Gaetwa, an ancestor of Woden, that the pagans formerly worshipped him as a god. The Church Historians of England, London, 1853, Vol. ii., Part i., 209. The same statement is made by the historian, Nennius, who calls him Gaet. Six Old English Chronicles. Bohn, 396.

[40] Grimm, Deutsche Mythologie, 137.

[41] Davies, British Druids, 118.

the Coptic article to the vowel form would give some such word as Bodan or Buodan; but, with the aspirate, it would make the Mæsogothic Vodans and the old Saxon Wuodan or Wodan, which the old High German, strictly in accordance with Grimm's law here, changes to Wuotan. The final *n*, which so far has appeared in every form of our word, is not an essential part of it. The Frisian Weda drops it, and it is wanting in the Welsh Aedd, in which we see the Danish *Gud* and the German *Gott*. Now this is the same as the *Choda* of the Persian, a language that has many remarkable points of resemblance to the Germanic tongues. The same word is found in the Sanskrit, and survives in the Hindustani *Khuda*. But the names of Buddha, which are by no means well understood, are simply the names for *God* with the termination restored, not as *n*, but as *m*. These are Codam, Godama, Gotama or Gautama; and give us back again the Gotan and Guotan of the Teutonic dialects. A link of great importance is furnished by a name of Woden, *Wegtam, the Wanderer*, which preserves the initial *g* along with the softened form of the Coptic article, and gives the termination of Gautama. Buddha, different as it appears in every respect from the word with which it is often ignorantly joined, is in reality the same, having doubtless come into the Sanskrit through some other channel than that by which Gautama entered. In it we find the final liquid wanting, the German *w*, in plain disregard of Grimm's law, changed to *b*, and the Frisian Weda reproduced. In confirmation of this I may refer to the case of identity already established between the Germanic *wot* or *wuot* and the Sanskrit *budh*, to perceive or know, of which the Welsh form is by no accidental coincidence *gwyddoni*. Thus in Buddha, Wotan and Gwydion we find not only the supreme god of the northern families of the Aryan stock, but also the symbol of knowledge among those different peoples.

(To be continued.)

LAHONTAN.

BY THE EDITOR.

(Continued from page 250.)

We begin with a letter, written at Michilimackinac in May, 1688, addressed by Lahontan to the Marquis de Seignelay, Minister for the Colonies, in relation to a leave of absence, which had been obtained for him to visit France for the purpose of attending to some private family affairs. We give this letter first, because in it Lahontan records some particulars in regard to his father. Also the family business which it mentions, repeatedly comes up in subsequent letters, and requires to be borne in mind. The document will explain itself. The Marquis de Seignelay is the son and the successor in office of the famous Colbert. Louis Quatorze is the reigning king. "Honoured Sir," Lahontan says, "I am the son of a gentleman that spent three hundred thousand crowns in deepening the water of the two Gaves of Bearn. He had the good luck to compass his end by conveying a great many brooks to these two rivers; and the current of the Adour was by that means so far strengthened as to render the bar of Bayonne passable by a fifty-gun ship, whereas in former times a frigate of ten guns durst not venture over it. It was in consideration of this great and successful attempt that his Majesty granted to my father and his heirs forever, certain duties and taxes amounting to the sum of three thousand livres a year. This grant was confirmed by an act of the Council of State, dated January 9th, 1658, signed Bossuet, collated, &c. Another advantage accruing to the King and the Province from my father's services, consists in the bringing down of masts and yards from the Pyrenean mountains, which could never have been effected, if he had not by his care, and by the disbursing of immense sums, enlarged the quantity of water in the Gave of Oleron to a double proportion. These duties and taxes which had been jointly entailed upon him and his heirs, ceased to be ours when he died; and to inflame the disgrace, I lost his places, viz: that of being an honorary judge of the parliament of Pau and Reformateur du Domaine des Eaux et Forêts for the Province of Bearn, all which were mine by inheritance. These losses are now followed by an unjust seizure which some pretended creditors have made of the Barony of Lahon-

tan, of a piece of ground that lies contiguous to it, and of a hundred thousand livres that lay in the hands of the Chamber of Bayonne. These faithless creditors have no other reason to sue me, but that I am now at the extreme end of the world, and that they are rich and supported by the credit and protection of the parliament of Paris, where they hope to make good their unjust pretensions in my absence. Last year I obtained leave to return to France, in order to take care of this matter; but now M. de Denonville has sent me with a detachment to these lakes; from whence I humbly petition that your Honour would vouchsafe me leave to come home the next year, and at the same time honour me with your protection. I am, with all possible respect, your Honour's, &c., &c."

When this memorial was addressed to the Marquis de Seignelay, Lahontan had been in Canada nearly five years. The first letter of the series of which Lahontan's volumes principally consist was written in 1683. It is dated at Quebec, Nov. 8th, in that year. Attached as a junior officer to one of three companies of marines, Lahontan had just arrived from Rochelle, in a frigate. He had not at the time completed his sixteenth year. De la Barre, the Governor-General of New France, had asked for a re-inforcement of six or seven hundred men to assist against the Iroquois, but only the force just named was sent, it being considered unadvisable to risk more on the seas at such a late season of the year. The time occupied in the passage is not exactly specified. No bad weather was experienced until the Banks of Newfoundland were reached. Here they caught incredible numbers of cod in 32 fathoms of water, and here the sailors performed on those who had never before made the voyage the ceremonies practised on novices crossing the Line, passing through the straits of Gibraltar, the Sound, the Dardanelles, &c.; persons of note and character, however, Lahontan observes, obtaining exemption on furnishing five or six bottles of brandy for the ship's crew. An officer and some men died of scurvy in the passage. On the Banks, the needle varied twenty-three degrees to the northwest. When only thirty leagues below Quebec they were on the point of turning back to France, the ice encountered in the river and the snowy appearance of the surrounding country alarming them.

The second letter is dated at Beaupré, [near Quebec,] May 2, 1684. Lahontan has now experienced one Canadian winter. His marines had been cantoned at Beaupré ever since their arrival. They were

now under orders to be in readiness to embark for Montreal in fifteen days. "Most of the inhabitants of Canada," he says, "are a free sort of people that removed hither from France, and brought with them but little money to set up withal. The rest are those who were soldiers about thirty or forty years ago, at which time the regiment of Carignan was disbanded and they exchanged a military post for the trade of agriculture. Neither the one nor the other paid anything for the grounds they possess, no more than the officers of the troops, who marked out to themselves certain portions of wild and woody lands; for this vast continent is nothing else than one continued forest. The governors-general allowed the officers three or four leagues of ground in front with as much depth as they pleased; and at the same time the officers gave the soldiers as much ground as they pleased, upon the condition of the payment of a crown per arpent by way of fief." After describing the exceptional mode in which, as he was informed, wives were provided for the rank and file of the settlers, he continues: "In this country every man lives in a good and well-furnished house; and most of the houses are of wood and two storeys high. Their chimneys are very large, by reason of the prodigious fires they make to guard themselves from the cold which is there beyond all measure from the month of December to that of April."

The third letter is dated Quebec, May, 15, 1684, and in it Lahontan describes Quebec and the Island of Orleans. During the winter he had been out on a hunting excursion with thirty or forty young Algonquins, "well made, clever fellows," he says. "My design in accompanying them," he explains, "was to learn their language, which is highly esteemed in this country, for all the other nations for a thousand leagues around (excepting the Iroquois and the Hurons) understand it perfectly well. Nay, all their respective tongues come as near to this as the Portuguese does to the Spanish. I have already made myself master," he adds, "of some words with a great deal of facility; and they being mightily pleased in seeing a stranger study their tongue, take all imaginable pains to instruct me."

Letters four, five, six, seven, and eight were all written at Montreal. The first three are descriptive of the country, and of the habits and customs of the people, native and immigrant. The seventh gives an account of De la Barre's abortive expedition against

the Iroquois in 1684. Lahontan and the three companies of marines accompanied De la Barre from Fort Frontenac to La Famine or Salmon River on the opposite side of Lake Ontario, where the final interview between the Governor and Grangula (La Grande Gueule), the representative of the Five Nations, took place. "All the world blames our General," Lahontan writes, "for his bad success. It is talked publicly that his only design was to cover the sending of several canoes, to traffic with the savages in those lakes for beaver skins. The people here," he says, "are very busy in wafting over to Court a thousand calumnies against him; both the clergy and the gentry of the long robe write to his disadvantage. Though after all," Lahontan asserts, "the whole charge is false, for the poor man could do no more than he did." The truth being that the force under M. De la Barre's command was immensely reduced in strength by a deadly fever which raged amongst them at Fort Frontenac, while preparing to penetrate the Iroquois territory. In returning to Montreal from this expedition, Lahontan and his marines descended the rapids in flat-bottomed boats made of deal, the first time such a thing had ever been done; accomplishing the distance from La Galette to Montreal in two days. The ascent from Montreal to Fort Frontenac had occupied twenty days.

The eighth letter is written from Montreal in June of the following year (1685). In it Lahontan describes M. de Callieres' preparations for the fortification of the town. All the inhabitants of the place and vicinity were ordered to cut down and bring in great stakes, fifteen feet in length. "During the winter," he says, "these orders were pursued with so much application that all things were now ready for making the enclosure, in which five or six hundred men are to be employed." Lahontan passed a portion of the winter again in a hunting excursion with the Algonquins. The rest of it was made unpleasant to him by the officiousness of the gentlemen of the Seminary, the "Seigneurs ecclesiastiques," as he speaks. On one occasion, he says, M. le Curé came to his lodgings when he was out, and observing among the books on the table a certain Romance he cruelly mutilated it, by tearing out a number of leaves. Lahontan was greatly enraged. "Ils ne se contentent pas," he exclaims, "d'étudier les actions des gens: ils veulent encore fouiller dans leurs pensées!" On the 30th of March he is sent with a small detachment to Chambly; but in the following October he is at Boucherville.

His ninth letter is dated there. In it he speaks of the arrival of M. de Denonville to take the place of M. de la Barre as Governor-General. The new Governor has brought over with him from France some additional companies of marines: and he is now at Montreal, whither he has proceeded with some 600 regulars, after a rest of a few weeks at Quebec. The army is put in winter quarters round Montreal. "My quarters," Lahontan says, "are at Boucherville which is at a distance of three leagues from Montreal." Letters ten and eleven were also written at Boucherville, and dated July 8, 1686, and May 2, 1687, respectively. The principal incidents narrated of the two intervening winters are moose-hunts, deer-hunts, otter-hunts and grouse-hunts. "Besides the pleasure of so many diversions," however, he says in the letter of May 2, "I was likewise entertained in the woods with the company of some of the worthies of former ages. Honest old Homer," he explains, "the amiable Anacreon, and my dear Lucian, were my inseparable companions. Aristotle too," he continues, "desired passionately to go along with me, but my canoe was too little to hold his bulky equipage of peripatetic syllogisms. So that he was even fain to trudge back to the Jesuits, with whom he is quite at home. I had a great deal of reason to rid myself of that great philosopher's company," he affects to say, "for his ridiculous jargon and his senseless terms would have frightened the savages out of their wits."

The twelfth letter is dated at "St. Helen's, over against Montreal," June 8, 1687. Lahontan has just heard that his relations in France have procured for him, with considerable difficulty, leave to return home to attend to his family affairs, and that the sooner he is in Paris the better. But M. de Denonville informs him that he cannot be spared just now. Great preparations were being made for a second expedition against the Iroquois, this time on a larger scale than before. The chevalier de Vaudreuil had come out to take command of the forces. A considerable army consisting of regulars and militia and 500 converted Indians (sauvages Crêtiens) was assembled in and about Montreal. He was about instantly to set off for Fort Frontenac on the way to the Iroquois country. After the campaign, Lahontan would be permitted to go.

The thirteenth letter opens with some obvious moralizing on the disappointments men are subject to. "It has been a maxim in all ages, that the events of things are not always answerable to men's

expectations. When men form to themselves a promising prospect of compassing their ends, they frequently meet with the mortification of seeing themselves disappointed. This I speak by way of application to myself," he says to his correspondent; "for instead of going to France pursuant to the contents of the letter I wrote to you two months ago, I am now obliged to proceed to the end of the world, as you will find by the following narrative of our expedition." This letter is dated at Niagara, Aug. 2, 1687. The incursion into the territory of the Iroquois had been made. Some bands of Indians from the far west had joined the force, at the mouth of the river of the Tsonontouans (the Genesee),—and fortunately, for after marching inland through woods seven leagues, Denonville and Vaudreuil with their men fell into an ambuscade and suffered severely at the hands of the Iroquois, when a complete panic prevailed, and the "Christian" and other savages did good service by attacking their red congeners, the Iroquois, putting them to flight, pursuing them to their village and slaying many of them. In this affair, on the French side ten Indians and one hundred soldiers were killed and twenty-two wounded. The French Indians brought back to Denonville eighty Iroquois heads. After laying waste and plundering the surrounding country the expedition withdrew and passed on up the Lake to the mouth of the Niagara River. Here, on the south or Iroquois side, a palisade fort with four bastions was erected. It was only three days in building. This was of course the original of the existing Fort Niagara. The Indians from the west who had accompanied Denonville, now dispersed, extremely dissatisfied with their white military chief for his supposed want of vigour. Denonville however had assured them of his fixed resolution to carry on the war against the Iroquois until they should be exterminated. To give confidence in that quarter, he decided to send to the west a small force; and as Lahontan had acquired a knowledge of the Algonquin dialects he was considered the proper person to be put in charge of the detachment. Accordingly on the very day of the departure of the Indian allies, "the general," says Lahontan in his 13th letter, "called for me and acquainted me that inasmuch as I understood the language of the savages, I was to go with a detachment to cover their country pursuant to their request. At the same time he assured me," Lahontan adds, "he would inform the Court of the reasons that moved him to detain me in Canada notwithstanding that he had orders to give me leave to go home.

You may easily guess," he continues, "that I was thunderstruck with this news, when I had fed myself all along with the hopes of returning to France, and promoting my interest which is so much thwarted. However I was forced to be contented, for the greater power bears the sway all the world over." He then describes his preparations for this expedition to the west and speaks of some of the persons who are to accompany him. "Pursuant to my orders," he says, "I made all suitable preparations for my journey without loss of time. I took leave of my friends who singled out the best soldiers for me, and made me presents of clothes, tobacco, books, and an infinity of other things which they could spare without inconveniency because they were then on their return to the colony (*i. e.* Quebec) which affords them everything that one can desire. By good luck," he continues, "I brought with me my astrolabe from Montreal, which will enable me to take the latitude of the lakes and to make several other useful observations, for, to all appearance, I shall be out two years or thereabout. The men of my detachment," he then says, "are brisk proper fellows and my canoes are both new and large. I am to go along with Mr. Duluth, a Lyons gentleman, who is a person of great merit, and has done his king and his country very considerable services. Mr. De Tonti makes another of our company; and a company of savages is to follow me. Mr. De Denonville will set out for the colony by the north side of Lake Frontenac in two or three days. He designs to leave at Fort Frontenac a number of men and ammunition equal to what he leaves here." (He had previously mentioned that 150 men were to be left at Fort Niagara under the joint command of M. des Bergeres and M. De Troyes, with ammunition and provision for eight months.)

Letter fourteen is written at Michilimackinac, and is dated May 26, 1688. Nearly a year has elapsed. He has grown somewhat indifferent to the situation of his private affairs in France, which he has just been informed by a letter, continues to be bad. "I am at a loss to determine," he says to his friend and patron, "whether it is owing to stupidity or to greatness of mind, that the loss of my estate which I infallibly foresee, does not at all affect me. Your letter is but too shrewd a confirmation of my prophecy. However I cannot but pursue your seasonable advice in writing to Court." To this letter is appended the memorial to the Marquis de Seignelay, which has already been given. He then proceeds with a narrative

of his journey westward from Fort Niagara in the preceding year. "I embarked at Niagara," he says, "on the 3rd of August in a canoe manned with eight soldiers of my detachment; and after running three leagues against the current of the strait, came that same day to the place where the navigation stops. There I met with the Sieur Grisolon de la Tourette, brother to M. Duluth, who had ventured to come from Michilimackinac in a single canoe to join the army. On the 4th we commenced the grand portage to the southward, being obliged to transport our canoes from a league and a half below the great Falls of Niagara to half a league above it. Before we got at any beaten or level path we were forced to climb up these Heights, upon which a hundred Iroquois might have knocked us all on the head with stones. While we were employed on this transport-service, we were alarmed twice or thrice, which cautioned us to keep a strict guard and to transport our baggage with all possible expedition. Nay, after all our precautions, we were forced to leave one-half of our baggage about half way upon the discovery of a thousand Iroquois that marched towards us. Do you judge, Sir, if we had not some reason to be alarmed, and whether we would stand to sacrifice all to the natural principles of self-preservation; though indeed we were in danger of losing our lives as well as our baggage; for we had not embarked above the Fall half a quarter of an hour when the enemy appeared upon the bank of the strait. I assure you I escaped very narrowly; for about a quarter of an hour before, I and three or four savages had gone five hundred paces out of our road to look upon that tremendous cataract, and it was as much as I could do to get at the canoes before they put off. To be taken by such cruel fellows was no trifling thing. *Il morir e niente, ma il vivere brugiando e troppo.* "To die is nothing, but to be burnt alive is too much."

He then briefly speaks of the Falls of Niagara. "This *Sault* or Leap," he says, "is seven or eight hundred feet high and about a half a league wide." He had, as we have seen, only a hurried glimpse of the Falls. He had just been accomplishing the distance from Queenstown, as we should speak, under difficulties. His imagination over-estimated the total height. In the same way the hostile Iroquois observed along the river bank may not have been exactly one thousand. By rowing strongly all night they reached the outlet of Lake Erie on the following morning. He remarks on the swiftness of the current. They coasted along the north shore

and frequently saw on the sands flocks of fifty or sixty wild turkeys. On the 6th of September they enter the Detroit river; on the 8th they are through Lake St. Clair, which is twelve leagues in circumference; on the 14th they are at the mouth of Lake Huron. Here was the Fort which Lahontan with his soldiers was to take charge of. This fort, we are informed, had been built by M. Duluth at his own expense and manned by the coureurs de bois. "The garrison surrendered their post," Lahontan says, "very cheerfully to my detachment, and then pursued their commerce with the savages, for everyone had leave to go where he pleased." This post is known as Fort St. Joseph. Its present representative is Fort Gratiot, nearly opposite our Canadian Port Sarnia. From some Iroquois prisoners captured by a party of Hurons and brought into Fort Joseph, Lahontan learns that the new Fort at the mouth of the Niagara river is beleaguered by eight hundred Iroquois, who intend, afte reducing that post, to come on and attack Fort St. Joseph. His provisions running short he starts on the 1st of April, 1688, with some of his men, for Mackinaw to collect Indian corn. He reaches Mackinaw on the 18th and finds corn very scarce. Whilst staying there, some of La Salle's party arrived with dispatches, as they assert, for France *via* Quebec. But Lahontan suspects that La Salle is dead: which was the fact. He had been murdered by his companions Duhaut and Liotot on the 19th of the preceding March, (1687), in the neighbourhood of the southern branch of the river Trinity in Texas, while endeavouring to strike the Mississippi. "On May the 6th," Lahontan says, "M. Cavelier arrived here being accompanied by his nephew, Father Anastase, the Recollet, a pilot, one of the savages and some few Frenchmen, which made a sort of party-coloured retinue. These Frenchmen were some of those that M. de la Salle had conducted upon the discovery of the Mississippi. They gave out that they are sent to Canada, in order to go to France with some dispatches from M. de la Salle to the King, but we suspect that he is dead, because he does not return along with them. I shall not spend time," he adds, "in taking notice of their great journey overland, which by the account they give cannot be less than 800 leagues." The M. Cavelier here mentioned was the Abbé Cavelier, a brother of La Salle's.

After purchasing sixty sacks of corn of about 50 lbs. each, Lahontan goes on to the Sault Ste. Marie with the hope of inducing some

of the Sauteurs or Outchipoués as he calls them, to join him in an expedition against the Iroquois. "Forty young warlike fellows" are persuaded to do so. They start together for the Fort St. Joseph, coasting the north and east sides of Lake Huron, after being joined by the soldiers whom he had left at Mackinac and a party of Ottawas. The forty young Chippeways occupied five canoes, each of which held eight men. They departed from the Sault on the 13th of June and reached Fort St. Joseph on the 1st of July. "We coasted the Manitoualin island," he says, "a whole day, and being favoured by a calm, crossed from isle to isle till we made the east side of the Lake. In this passage we crossed between two islands that were six leagues distant the one from the other; and upon that occasion our canoe men, who were not used to venture so far out in their boats, were fain to tug hard at their oars. The savages stood out at first and refused to venture so far from land, for they would have rather gone fifty leagues about; but at last I overpersuaded them by representing that I would have been very loth to venture my own person if I had not been sufficiently provided against all danger by an exact knowledge of the winds and the storms. The calm continuing we made the River Theonontaté on the 25th." The two islands six leagues asunder were probably those known at the present day as Fitzwilliam island and the isle of Caves: the latter just off Cape Hurd. The River Theonontaté was, as we may suppose, the Maitland.

On the 3rd of July they are all on the move for Lake Erie. This excursion is described in the fifteenth letter, dated September 18th, 1688. On the 7th of July they are at the entrance of the river Condé (Cataraugus creek) towards the eastern extremity of the Lake. They here fell trees and build a kind of barricade. The Sauteurs and Ottawas proceed two days' march up the stream intending to plunder some villages. They suddenly come upon a large party of Iroquois and instantly take to flight. Lahontan is startled to hear the sentinel in the redoubt crying out *aux armes! notre parti est battu et poursuivi!* No enemy appeared however until the following day: and then no engagement took place. Lahontan learned from one Cha-ou-a-non, an escaped slave, who came into the redoubt, that the number of the Iroquois band was four hundred, and sixty more were expected from the Miami country with prisoners or slaves. Cha-ou-a-non was able also to report that at the time when Denonville was concocting measures with the Iroquois for peace, an agent

of the Governor of New York, dissuaded them from listening to Denonville. The name of this emissary is here given as Aria. (It was doubtless the interpreter, Arnout Cornellsson Viele, who, as other authorities state, was known among the Iroquois as Arie). The Sauteurs and Ottawas now propose to move westward and intercept the sixty Iroquois and rescue the prisoners. On the 24th, accordingly, Lahontan's party begin to retrace their course along the south shore. On the 28th, while resting on an island, they descry canoes at a distance. The Sauteurs contrive to pass over to the main land and conceal themselves in the woods, the Ottawas and soldiers remaining where they were. The boats near the island, but on observing a band of men on the shore they sheer off to the mainland, where they are assaulted by the Sauteurs. Of twenty Iroquois three are killed, five are wounded. The rest are captured, and the prisoners, twenty-four in number, including seven women, are liberated. Four Sauteurs however lose their lives. It is learned that the remainder of the Iroquois band, having with them thirty-four prisoners, male and female, are on their way eastward by land. It was resolved to intercept these also. On the 4th of August this was accomplished, but the precipitancy of the Ottawas who fired too soon, enabled the Iroquois to escape, with the exception of ten or twelve who were killed. The prisoners were all rescued. On the 13th the whole party are in the Detroit river, where they rest, among the islands, for eight days, and feast on venison, wild turkeys, and wild fruit, "which was fully ripe." On the 24th they are all again at Fort St. Joseph. Here Lahontan finds a party of fifty Miami Indians commanded by one Michitonka, who had just returned from a hostile excursion in the Iroquois country in the neighbourhood of Fort Niagara. Michitonka reported that the scurvy had carried off all the men left at that post with the exception of twelve. M. de Troyes, the commandant of the Fort, had died, and M. de Bergeres had removed with the twelve survivors to Fort Frontenac, where a like mortality had prevailed. The Governor of Canada, Denonville, was negotiating a peace with the Iroquois, and Michitonka had been desired to return to his country with his band, and to undertake no more hostile expeditions for the present against the Iroquois. Under the circumstances, Lahontan, after due consideration, resolved to abandon Fort St. Joseph and retire to Michilimackinac. On the 27th they set fire to

the Fort and started for Michilimackinac, by the south shore. The Miamis return home overland. At Michilimackinac Lahontan finds M. de la Durantaye, commander of the Coureurs de bois in the far west and south, who has lately come up from Quebec. He has brought to Lahontan funds wherewith to pay his men, and orders to return to Quebec, with his soldiers, at once, if the season should permit; if not, in the following spring. The French and natives give it as their opinion that it would be unsafe to set out now. It was this detention that led to the famous expedition to the Mississippi and up the Rivière Longue. "I am on the point of undertaking another journey," he says at the close of his fifteenth letter, "for I cannot mew myself up here all this winter. I design to make the best use of my time, and to travel through the southern countries of which I have heard so much, and I have engaged four or five good huntsmen of the Ottawas to go along with me." The sixteenth letter is taken up with an account of this expedition. He leaves Mackinaw on the 29th of September with his detachment and five Ottawa huntsmen. "All the soldiers," he says, "were provided with new canoes loaded with provisions and ammunition, and such commodities as are proper for the savages." On the 9th of the following month he is at Fort Outagamis, and his party is increased by the addition of ten Outagamis warriors who understood the language of the Eokoros up the Rivière Longue. On the 19th he has reached the river Wisconsin, after performing the usual portage, and in four days more he is on the Mississippi. On the 3rd of November he enters the Long River. On the 8th they have reached the country of the Eokoros. On the 12th they proceed on, accompanied by an escort of five or six hundred Eokoros. On the 21st he is among people "who are very civil and so far from a wild savage temper that they have an air of humanity and kindness." Their huts were long and rounded at the top, made of reeds and bulrushes and cemented with a sort of fat earth. The men and women go naked. The chief of the village here presented him with six slaves of the Essanapés, a tribe hostile to his, inhabiting about 60 leagues up the river. On the 27th they reach a village of the Essanapés. On the 3rd of Dec. they arrive at the principal village of the Essanapés. The head chief here furnishes him with a convoy of two or three hundred men, to accompany him to the country of the Gnacsitares who were allies of the Eokoros, against especially the Mozeemleks, "a nation who never took the

field, the Eokoros said, without 20,000 men at least." Lahontan leaves his canoes at the chief village of the Eokoros, and proceeds in five "pirogues" or log-canoes. Four days after leaving the village of the Eokoros the party were put to some inconvenience from the cold. "The first day (after leaving the village) we had enough to do," Lahontan says, "to run six or seven leagues by reason of the bulrushes with which the lake is encumbered. The two following days we sailed 20 leagues. The fourth day a west-north-west wind surprised us with such a boisterous violence that we were forced to put ashore and lay two days upon a sandy ground where we were in danger of perishing from hunger and cold; for the country was so barren that we could not find a chip of wood wherewith to warm ourselves or to dress our victuals, and as far as our eye could reach there was nothing to be seen but fens covered with reeds and clay, and naked fields. Having endured this hardship, we started again and rowed to an island upon which we encamped, but found nothing there but prairie; however to make some amends we fished up great numbers of little trouts upon which we fed very heartily. At last, after sailing six days more we arrived at the point or land's-end of that island which you see marked with a *fleur de lis* in my map. It was then the 19th day of December, and the severity of the winter had not as yet been great." On the 19th of December villages of the Gnacsitares are sighted. The Essanapé messengers whom he sends to the village are at first badly received, because it is imagined that Lahontan and his soldiers are Spaniards from New Mexico. The Gnacsitares instantly send swift runners to a tribe 80 leagues to the south, who were acquainted with Spaniards. Some of these speedily arrive and pronounce the new comers not to be Spaniards. Friendly relations are then speedily established between Lahontan and the Gnacsitares. He remained in the neighbourhood until the 26th of January, when, after setting up a pole bearing the arms of France engraved on a plate of lead, he began his return. The site of this pole the soldiers named "Lahontan's limit." On the 5th of January he is again in the country of the Essanapés. On the 2nd of March he is floating on the Mississippi. By the 17th he has descended to the mouth of the Missouri. An excursion is made up this river as far as the Osage. They then return. On the 25th they are again in the Mississippi. On the 29th they are at the mouth of the Wabash. Lahontan regretted that he had not time to make an ex-

cursion up that stream, which was navigable, he was assured, for 100 leagues. He now reascends the Mississippi and is at the River Illinois on the 9th of April. On the 16th he is at Fort Crevecœur on that river. On the 24th he has made the portage and is at Chicago. On the 28th he has pushed across the lake to the mouth of the St. Joseph, where La Salle had once established a fort. On the 22nd of May he arrives at Michilimackinac.

At p. 245, we have spoken too strongly of the general improbability of the expedition up the Rivière Longue. On again inspecting the narrative the particulars which it recounts do not appear so unworthy of credit. The special character, circumstances and object of the writer must, as we have already intimated, be taken into consideration, and some allowance accordingly made for over-coloring. The winter of 1688-9 may have been unusually open and mild. It is to be remembered that westward of Lake Superior the climate is not everywhere what the parallel of latitude would indicate. So that, after all, it is possible that Lahontan may have made his way in the manner described, up the Minnesota River, as far as the western extremity of the Lac-qui-parle. On the continuation of the stream sketched on buckskin for him by the Indians, Big Stone Lake seems to be laid down. On the engraved map accompanying the letters, a bold double-dotted line is drawn vertically through the fleur-de-lis which marks the limit stated to have been reached—a point distinguished also by the word "Borne." The double-dotted vertical line divides the portion of the map sketched by the Indians from the portion drawn by the traveller from personal observation, and is inscribed in large letters, "Separation de ces deux cartes," showing that the two portions were to be regarded as two distinct maps. over the Indian portion, moreover, is written in conspicuous letters, "Carte que les Gnacsitares ont dessiné sur les peaux de cerfs, &c.;" while over the traveller's own portion is written in a similar manner, Carte de la Rivière Longue, &c." Have we in the Essanapés, the Assiniboines; in the Gnacsitares, the Chocktaws; in the Eokoros, the Absorokas, by the English called Crows?

Letter seventeen is dated at Quebec, Sept. 28, 1689. The writer left Mackinaw on the 8th of June. On the 9th of July he is at Montreal. "The navigation is pretty safe from Michilimackinac to French River," he says; "for in coasting along Lake Huron we meet with an infinity of islands which serve as a shelter. But in going up

that river there is some difficulty; for it has five cataracts which oblige us to turn out and carry all overland thirty, fifty, and an hundred paces. Having passed that river we entered Lake Nipissing, from whence we are forced to transport our canoes and baggage two leagues overland, to another river which has six or seven rapids, which the canoemen commonly shoot. From that river there is another land-carriage to the river Creuse, which falls with rapid currents into the great River of the Ottawas, near a place called Mataouan. We continue our course upon this great river till we come to the point of the island of Montreal, where it is lost in the great river St. Lawrence." Here within three leagues of Montreal Lahontan's canoe was upset in a rapid, and he narrowly escaped drowning. "This was the only time I was in danger through the whole course of my journeyings," he observes. On this occasion an Indian was drowned, and a canoe, with the packs of six savages, was lost. On the day after his arrival he waits on M. de Denonville and gives him an account of his travels. At the end of September a vessel from France brings the tidings that M. de Denonville is recalled, and that Frontenac is re-appointed Governor in his place. "The gentlemen, merchants and other inhabitants are making preparations for solemnizing his arrival, which they expect," Lahontan says, "with as much impatience as the Jews do the Messiah! The very savages," he continues, "show an uncommon joy upon the hopes of his return. And indeed," he observes, "we need not think it strange, for that Governor drew esteem and veneration, not only from the French, but from all the natives of this vast continent, who looked upon him as their guardian angel." Lahontan concluded his letter by saying, "I make account to set out for Rochelle, when the vessel that brings our new Governor returns to France." Nevertheless he is still at Quebec on 15th of the following November (1689), the date of the eighteenth letter. Frontenac wants his services in Canada, and the visit to France is again postponed. Lahontan has received the intelligence that his hereditary property near Pau had been actually sold; but that he may recover it by reimbursing the sum paid, and proving that he was actually in the King's service in remote parts of the world when the estate was sold. Frontenac proceeds to Montreal for a few days after his arrival, and takes Lahontan with him. M. Mantet is sent forward to Fort Frontenac to repair the works there.

Letter nineteen is dated at Montreal, Oct. 2, 1690. Nothing very

striking has been accomplished during the year. Frontenac has sent a messenger, "the Chevalier D'Eau," to treat of peace with the Iroquois; but the Chevalier had been handed over as a prisoner to the English, and the party that accompanied him had been cruelly burnt by the Iroquois, this in retaliation for the massacre of certain Iroquois envoys through treachery in the preceding year. Lahontan had declined this mission, and Frontenac afterwards remarked that out of twenty captains that offered to execute that service, he was the only one who had been capable of foreseeing its bad results. Lahontan had been out with a detachment to protect the reapers at Fort Roland, in the island of Montreal. Frontenac hears that an English fleet is coming up the river to attack Quebec. He hastens down, and Lahontan is in his train. They accomplished the distance between Montreal and Quebec in three days. In letter twenty, Sir Wm. Phipps' unsuccessful attempt on Quebec is described. Lahontan is sent by Frontenac with despatches to France. He leaves Quebec in a frigate so late in the season as the 20th of November. On the 12th of January he is writing letter twenty to his friend from Rochelle. He has heard that the Marquis de Seignelay is dead, to whom he had a strong recommendatory letter from Frontenac. In letter twenty-one, Lahontan describes his interview with the Minister Pontchartrain, De Seignelay's successor. Pontchartrain is acquainted with his affairs, and says that he may try what he can do in relation to them; but that he must return to Quebec in one of the autumn ships. Lahontan finds it too costly a thing to prosecute his suit for the recovery of his property. He takes a singular step. A relative of his, the Abbé d'Ecouttes had made him a present of one hundred louis d'or, and he laid them out in acquiring an admission into "the Order of St. Lazarus," an ancient military confraternity having, so to speak, benefit of clergy (privilege de clericature). He hoped that the same relation would bestow on him some simple benefice which he might throw in his way without injuring himself; but it seems," Lahontan says, "a scruple of conscience stood my enemy." He then, through M. Pontchartrain, asks "a place" of the King; and after fruitless solicitations for what, he says, I thought I had some title to in consideration of my services, I received this answer—that the King would order M. de Frontenac to provide for me as handsomely as he could when an occasion offered." He returns to Quebec in the ship *Honoré*, sailing from Rochelle on the 28th of July, 1691, convoyed as

far as Cape Finisterre by the Count d'Aunay. On the 6th of September the *Honoré* is in the Gulf, and is attacked by an English ship. "The fight lasted two hours, and both sides fired continually one upon another, but the sea being tempestuous we were obliged to sheer off as night came on, without suffering any other loss than the wounding of two seamen and the receiving of twenty-eight or thirty shot in our masts, sails and rigging." On the 18th they are at anchor at Quebec. Letter twenty-three is written on the 25th of October in the following year (1692). Lahontan is now once more back in France. He writes from Nantes. He has been sent over by Frontenac to obtain the royal sanction to a scheme of defence against the Iroquois—a scheme which Lahontan himself has suggested, and which he is to carry into effect if the proper authorization can be procured. "I project," he says, "to build and maintain three forts upon the course of the lakes, with some vessels that shall go with oars, which I will build according to my fancy; but they being light and of great carriage may be managed either with oars or a sail, and will also be able to bear the shocks of the waves. I demand fifty seamen of the French Biscay, for they are known to be the most dexterous and able mariners that are in the world. I must also have two hundred soldiers, chosen out of the troops of Canada. I will build three fortresses in several places: one at the mouth of the Lake Erie; the second where I maintained a fort in 1687 and 1688 (Fort St. Joseph) at the southern extremity of Lake Huron; and the third at the mouth of the Bay of Toronto, upon the same lake (Matchedash bay). Ninety men will be sufficient to garrison these three redoubts, and perhaps a smaller number; for the Iroquois who never saw a cannon but in a picture, and to whom an ounce of powder is more precious than a louis d'or, can never be persuaded to attack any kind of fortification. I desire of the King for putting this project in execution, 15,000 crowns a year for the maintenance, entertainment, subsistence and pay of these 250 men. It will be very easy for me to transport, with the above-mentioned vessels, 400 savages into the country of the Iroquois whenever I have a mind. I can carry provisions for 2000, and transport as many sacks of Indian corn as are necessary for maintaining these forts both winter and summer. It is easy to have plenty of hunting and shooting in all the isles, and to contrive ways for crossing the lakes; and it will be so much the more easy to pursue the Iroquois in their canoes and sink them, that my vessels are light and my men

fight under a cover." Lahontan sailed from Quebec on the 28th of July, in the *St. Anne* frigate. On the 18th of August he has put into Placentia bay, in Newfoundland. While lying there an English fleet appears before the place—five vessels, one of them, the *St. Albans*, carrying 66 guns and 600 men. In the fort was a force of only 50 men, with a scant supply of ammunition. It was supposed that the English would land and get in rear of the fort, which was fully commanded from behind. Just as the boats from the fleet, fifty in number, carrying six or seven hundred men, were nearing the only practicable landing place, Lahontan and sixty Biscayan sailors suddenly present themselves on the shore, when the boats draw off and row to another point. The Biscayans were premature in thus discovering themselves, but Lahontan could not restrain them. The effect on the invaders, however, was that which has been described. It was gathered afterwards from a French pilot that it was imagined by the English officers that there was a body of fourteen or fifteen hundred seamen in Placentia; and that the detachment seen at the landing places was simply a decoy to an ambuscade. The next day, after cannonading the fort with little effect for nearly five hours, and setting fire to the building at Pointe Verte, the fleet set sail. On October the 6th, the *St. Anne* proceeds on her way, accompanied by a number of vessels. On the 23rd they are at anchor in the harbour of St. Nazere, eight leagues from Nantes.

On the 10th of May in the following year (1693) Lahontan is again writing at Nantes. He has been to Versailles. The scheme for the forts has been laid by M. de Pontchartrain before the king; but the project is not sanctioned. The king has sent out orders to M. de Frontenac to make peace with the Iroquois on any terms. Lahontan's former prayer for a "place" is however complied with. He is appointed "Lieutenant du roi" for Newfoundland and Acadia, with the command of a "free company" of 100 men. And this is in acknowledgment, he is told, of his gallantry at Placentia in the preceding August. Nevertheless, he adds, it was not he, but the sixty impetuous Biscayans whom he could not restrain, that prevented the landing of the English. "Thus how often it happens," he observes, "that such persons are preferred, who have no other patrons in the world but chance." He would have chosen rather to return to Canada for, says he, a solitary life is most grateful to me

and the manner of the savages are to my taste." He is now at Nantes expecting to sail in a few days from St. Nazere in a vessel supplied by the government to the Messrs. d'Angui, merchants of Nantes, who, in return for a royal monopoly granted them, undertake to maintain the garrison at Placentia. In letter twenty-five he informs his friend that after a detention of some fifteen days at St. Nazere he sailed on the 12th of May. He arrives at Placentia on the 20th of June, having captured on the Banks, an English ship laden with tobacco. "After landing," he says, "I went to salute M. Brouillon, Governor of Placentia, and declared to him how glad I was to obey the orders of so wise a commander. He answered that he was much surprised to find that I had solicited to be employed there without acquainting him with it the preceding year, and that he now plainly perceived that the project about the lakes of Canada, which I had mentioned to him, was a mere sham pretence. I endeavoured in vain to persuade him to the contrary, for it was not possible for me to undeceive him. Nevertheless, he goes on to say, I landed my goods and hired a private house till such time as I could build one for myself, a work which I carried on with so much diligence that it was finished in September by the assistance of the ship carpenters, who were lent me gratis by all the Biscay captains in the harbour. Irreconcileable differences arose between Lahontan and his superior. These at length came to such a pass that Lahontan decided to throw up his position and escape from the country, for from representations sent home by Brouillon, secretly as the latter mistakenly supposed, he expected that orders would come out for his arrest and transhipment to France, where probably a tedious detention in the Bastile would be his fate. "Fancying that I had solicited my employment," Lahontan says, "without taking notice of him, Brouillon treated me with all manner of reproaches and outrages from the time of my landing to that of my departure, and was not satisfied with appropriating to himself the profits and advantages of the free company that was given me, but likewise stopped without any scruple the pay of the soldiers, that were employed in the cod-fishing by the inhabitants, and made the rest work without wages. I shall take no notice," Lahontan continues, "of his public extortion, for though he has formally contravened the ten articles contained in the orders of Louis XIV., yet he had so many friends in all the

courts that he could not be found guilty. There is some pleasure in making gifts after his fashion: for by them he has made 50,000 crowns *per fas et nefas* in the space of three or four years. If I offered to give you a particular account of all the trouble and vexation he gave me, I should never have done." On the 14th of December he gets on board a small vessel, the last of the season that is leaving for the other side of the Atlantic. The captain engages to land him on the coast of Portugal for 1,000 crowns. Lahontan had earnt that Brouillon had taken the precaution to forward orders for his arrest to the governors of Belleisle, Ré and Rochelle, in the event of his disembarking at either of those places. They had a very stormy passage and are attacked when nearing the Portuguese coast, first by a Flushing privateer and then by a corsair from Sallee. Towards the end of January he is landed at Viana in Portugal. "As soon as we came to an anchor," Lahontan says, "I paid down my 1,000 crowns to the captain, who has reason to look upon this act of his as one of the best he ever did in his lifetime. The long boat was no sooner in the water," he continues, "than I went ashore with all my baggage; as soon as I came into the city I procured ammunition and provisions for the ship with such expedition that the captain weighed anchor the very next day and so continued his course to France."

On the 20th of April, 1694, Lahontan is writing to his aged friend from Lisbon, giving him a copious account of the country, the inns, the manners of the people, &c. It appears that he had been making some further application to Pontchartrain in relation to his affairs, without success. "After the receipt of some bad news relating to my business," he says, "I find I have spirit enough to brave all the jolts of fortune. The universe which swallows and Jesuits take for their country must likewise be mine until such time as it please God to send to the other world some persons that do Him very little service here." At the close of the letter he is more clear. "I am setting out immediately," he says, "for the northern kingdoms of Europe, waiting patiently until it pleases God that M. Pontchartrain should either remove to Paradise, or do justice to him who shall always be yours more than his own." Lahontan is not very explicit in regard to himself. He does not account for his movements. His next letter is written at Travemunde (the port of Lubeck, on the

Baltic) in 1694, no other date is given, and contains "an account of the author's voyage from Lisbon to Guernsey: his adventure with an English man of war and a privateer: a description of Rotterdam and Amsterdam: the dimensions of a Flemish sloop: a description of the city of Hamburg: the author's journey from thence to Lubeck, and a description of that city." The following letter is written at Copenhagen, September 12th, 1694. It contains "a description of the port and city of Copenhagen: a view of the Danish court: and of the humours, customs, commerce, forces, &c., of the Danes." He appears to have found a friend in M. de Bonrepeau, the French ambassador in Denmark; and protected by letters from him, he ventures once more to Paris, to explain in person his conduct at Placentia. The next letter is written at Paris and is dated December 29th, 1694. It contains "a Journal of the Author's travels from Copenhagen to Paris." The passage in it that concerns us in the present inquiry is the following. "Immediately upon my arrival at this place I repaired to Versailles to deliver M. de Bonrepeau's letters: but the persons to whom they were addressed used their utmost efforts to no purpose in soliciting M. de Pontchartrain to allow me to justify my conduct at Placentia. He answered them very coldly that His Majesty's inflexible spirit would never admit of any justification from an inferior in opposition to his superior. This answer which in some measure tarnishes the shining merit and judicious conduct of so wise a prince, gave me to know that the serenity of M. de Pontchartrain did not proceed so much from a principle of equity as from a stiff Iroquois temper. In the meantime," he continues, "I was like to die for grief, notwithstanding that all my friends endeavoured to solace me in advising me to raise my mind above the shocks of bad fortune, till a change of government happened." The next letter was written at Erleich near Lahontan in Basse Navarre, July 4, 1695. It gives "a view of the superstition and ignorance of the people of Bearn: their addictedness to the notions of witchcraft, apparitions, &c., and the author's arguments against the delusion." Lahontan has taken a run down to his native province. "Doubtless you will be mightily surprised when you hear I am now in sight of a country, of which I retain no more than the bare name; but your surprise will be yet greater when you are informed that all the recommendations of persons of the first

quality about court could not influence M. de Pontchartain, whose prepossession against me is invincible. I left Paris with a melancholy mind and went to solace myself for some months in a certain province of the kingdom which you will easily guess." He gives a hint to his old patron that he is in want of money. "The country I am now in is a very good country," he says, "but I do not find money stirring amongst us, which, by my troth, I do not like, for among the Europeans one cannot live without money as they do among the Hurons of Canada. I always think of that country with regret," he says, "when my pocket is at low-water mark and my mind disquieted with care and anxiety, in contriving how to fill it with a precious metal that gives life and spirit to the poorest sort of men and inspires them with good qualities." The following letter is dated at Huescon, July 11, 1695. It contains "an account of the author's wonderful escape; he being taken for a Huguenot and examined by the ignorant curés." While at Erleich he receives a letter from "a certain person" at Versailles, the tenor of which made it advisable for him to cross the lines into Spain as speedily as possible. "I had no sooner read my letter," he says, "than I marched straight to my lodging to contrive within myself some way to get safe out of the kingdom. You may be sure my council was soon assembled, for such a headpiece as mine does not use to spend much time in consultations. I determined," he says, "to delude my landlord by desiring him to give me an account in writing of the road to Agen where I pretended to have some business. The best of the matter is I have already got out of my farmers nearly 200 pistoles and a fine horse, which I was obliged to for my lucky deliverance. I got up by the break of day and desired a guide to conduct me out of one of the gates of the city that leads a quite different way from that I had in my eye." At Laruns, the last village of Bearn, he is suspected to be a Huguenot escaping out of the country, but he contrives to satisfy the local curé before whom he is interrogated. By the aid of a guide mounted on a mule he crosses the Pyrenees and the day after leaving Laruns he is at Sallent in Spain. The final letter of Lahontan's book is written at Saragossa, October 8, 1695. It is taken up with "a description of Saragossa, a view of the government of Arragon, and an account of the customs of the people." It contains nothing illustrative of the personal history of Lahontan.

The first edition of the Letters, published at the Hague in 1703, was inscribed to the King of Denmark, Frederick IV., who it would seem exhibited sympathy for Lahontan's case, probably through the representations of M. de Bonrepeau, the French ambassador. The English translation, published soon after in London, is dedicated to the Duke of Devonshire, who appears to have patronized Lahontan when in England after his visit to Denmark. The following is the text of the Dedication: "To his Grace, William, Duke of Devonshire, Lord Steward of Her Majesty's Household, [Anne has just succeeded William III.,] Lord Lieutenant of the County of Derby, Chief Justice in Eyre of all Her Majesty's Forests, Chaces, Parks, &c., Trent-north; one of the Lords of Her Majesty's Most Honourable Privy Council, and Knight of the Most Noble Order of the Garter. My Lord, Since I had the honour to present the King of Denmark with the first part of this Book, I presume to make a present of the latter to your Grace. In making the first dedication, I had no other inducement than a due regard to the benefits I received from his Majesty's favour; and the same motive in reference to your Grace has prompted me to make this acknowledgment of the undeserved favours you kindly vouchsafed me. I did not dare to launch out into the praise of his Danish Majesty, who has a just title to all sorts of encomiums, by reason that the little French I had has been forgot among a sort of people that take panegyrics to be affronts. It is with the same view, my Lord, that I decline the pleasure of publishing those distinguishing qualities that place your Lordship at the head of the most accomplished grandees of the world, and the most zealous patriots of their country. I am, with all gratitude and veneration, your Grace's most humble and most obedient servant, Lahontan."

Frederick IV., of Denmark, was a contemporary of Charles XII., of Sweden, and was engaged in several unsuccessful conflicts with that warlike monarch. Lahontan may have hoped to obtain employment in his armies. The Duke of Devonshire addressed, was the first Duke and the fourth Earl, of the county named. Through his interest Lahontan may have hoped for some professional work under Marlborough, on the continent. The battle of Blenheim had lately been fought. In regard to the appearance of his letters in print, Lahontan makes the following declaration in the preface to the Eng-

lish edition: "Having flattered myself," he says, "with the vain hopes of retrieving the King of France's favour before the declaration of this war, I was so far from thinking to put these letters and memoirs to the press, that I designed to commit them to the flames, if that monarch had done me the honour of reinstating me in my former places with the good leave of the Messieurs de Pontchartrain, the father and the son. It was with that view that I neglected to put them in such a dress as might now be wished for, for the satisfaction of the reader that gives himself the trouble to peruse them." The two Pontchartrains he considers to be his enemies. Towards the end of his preface he speaks of them again. "I envy the state of a poor savage," he says, "who tramples upon laws and pays homage to no sceptre. I wish I could spend the rest of my life in his hut, and so be no longer exposed to the chagrin of bending the knee to a set of men that sacrifice the public good to their private interest, and are born to plague honest men. The two ministers of State I have to do with," he continues, "have been solicited in vain by the Duchess of Lude, Cardinal Brouillon, Count Guiscar, M. de Quiros, and Count d'Avaux. Nothing could prevail, he says, though all that is laid to my charge consists only in not bearing the affront of a governor whom they protect, at a time when a hundred other officers who live under the imputation of crimes infinitely greater than mine, are excused for three months' absence from Court. Now the reason is that they give less quarter to those who have the misfortune to displease the two Messieurs de Pontchartrain, than to such as act contrary to the King's orders."

What finally were the fortunes of Lahontan, and when and where he died, we have not been able to discover. At the time of the publication of his Letters in English (1704), he was still only about thirty-seven years of age, if, as he says, he was between his fifteenth and sixteenth year when he went to Canada in 1683. We part company with him in England; and it is pleasant to hear him at the beginning of the last century bearing the same grateful testimony to the character of his temporary home, which refugees from the adjoining continent and elsewhere have again and again been constrained to bear in almost every successive year that has since intervened. "After all my misfortunes"—these are the words with which Lahontan closes the preface to his work—"after all my misfortunes, I have

this to solace me, that I enjoy in England a sort of liberty that is not met with elsewhere. For one may justly say that of all the countries inhabited by civilized people, this alone affords the greatest perfection of liberty. Nay, I do not except the liberty of the mind," he says, "for I am convinced that the English maintain it with a great deal of tenderness. So true it is that all degrees of slavery are abhorred by this people, who shew their wisdom in the precaution they take to prevent their sinking into a fatal servitude."

It would not be fitting to discuss here the contents of a certain dialogue in the strain of Lucian, to be found only in the English edition of Lahontan's Letters. We simply note that the interlocutors are Lahontan himself and a Huron chief, Adario, popularly known among the contemporary Lower Canadian French as the Rat. The subjects handled are (1) Religion as set before the Indians by the Jesuits; and (2) the Laws, Morals, and Customs of Civilized Life, as represented by the France of the period of Louis XIV. (Adario is supposed to have travelled in Europe). Lahontan acts the part of apologist on the side of the Jesuits and French conservatives generally; but he puts into the mouth of the observant savage some criticisms that are very trenchant. The preface to the English edition of Lahontan's Letters makes us acquainted with the rather interesting circumstance that the Count de Frontenac had examined this dialogue, and had, in some degree, assisted in its composition and arrangement. One allusion occurs in it to the writer's personal affairs. Adario speaks of what he has heard of corrupt judges in the French courts. Lahontan replies, ironically of course: "The bad judges you speak of are as uncommon as white beavers; it is a question if there are four such in all France. [He could have named, perhaps with pleasure, the persons glanced at.] Our judges are men that love virtue, and have souls to be saved as well as thou and I," &c. "They curb libertinism, they redress disorders, and do justice to all that sue for it, without the least regard to what we call interest. As for my own part," Lahontan then adds, "I have lost my whole estate by being cast in three or four lawsuits in Paris; but I would be loth to believe that the judges are in fault, notwithstanding that my adversaries found both money and friends to back bad causes. It was the Law that gave it against me, and I take the Law to be just and reasonable, imputing my surprise upon the mat-

ter to my unacquaintedness with that study." To which Adario rejoins: "I protest I do not understand one word of what thou hast said; for I know the contrary of what thou sayest to be true; and those who informed me so of the judges are men of undisputed honour and sense."

The following is the account which Lahontan gives of the dialogue with Adario, of its appearance in an English dress, and of the assistance which the Count de Frontenac afforded him when moulding it into shape: "While my book was printing in Holland," he says, "I was in England; and as soon as it appeared, several English gentlemen of a distinguished merit, who understood the French as well as their mother-tongue, gave me to know that they would be glad to see a more ample relation of the manners and customs of the people of that continent whom we call by the name of savages. This obliged me to communicate to these gentlemen the substance of the several conferences I had in that country with a certain Huron whom the French call Rat. While I stayed at that American village, I employed my time very agreeably in making a careful collection of all his arguments and opinions; and as soon as I returned from my voyage upon the lakes of Canada, I showed my manuscript to Count Frontenac, who was so pleased with it that he took the pains to assist me in digesting the dialogues and bringing them into the order they now appear in; for before they were abrupt conferences without connexion. Upon the solicitation of these English gentlemen, I have put these dialogues into the hands of the person who translated my Letters and Memoirs. And if it had not been for their pressing instances, they had never seen the light; for there are but few in the world that will judge impartially and without prepossession of some things contained in them."

NOTE ON A

REMARKABLE BELT OF AURIFEROUS COUNTRY

IN THE TOWNSHIP OF MARMORA, IN ONTARIO.

By E. J. CHAPMAN Ph. D.,

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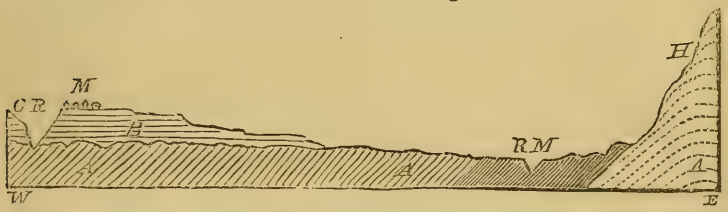
The occurrence of auriferous rock throughout the greater portion of the district of North Hastings, in Ontario, has long been known; but much discredit has been thrown upon this region as a source of gold-supply by the extravagant and too often baseless statements, put forth from time to time, respecting the so-called "gold quartz" of the district; as well as by the general want of success that has attended the gold mining operations carried on more especially in Madoc and adjoining townships. Much of this has arisen from a mistaken notion respecting the true gold-bearing ore of the district: or, in other words, from the almost universal assumption that gold was to be looked for only in association with quartz. Many of the quartz bands or veins of North Hastings undoubtedly contain a small amount of free gold; but it cannot be too strongly insisted upon, that, in these pure quartz deposits, gold is only accidentally present, whilst it occurs invariably, and generally in paying quantity, in every vein or other deposit in which, in this district, arsenical pyrites is contained. So far as regards the district in question and the surrounding country, I am convinced from an overwhelming mass of evidence that the only matters likely to prove a permanent source of gold-supply are these arsenical ores. They are always, it is true, in a quartz gangue; but all the gold, apart from a few small specks or nuggets, seemingly separated or rendered free by contact with the quartz, is contained in the arsenical mineral. I have proved this by numerous assays made on samples of ore obtained personally from various localities in the Hastings region and adjacent parts of Canada. In many of these samples, the mispickel, when carefully separated from the accompanying quartz, has yielded an amount of gold equivalent to more than five or six ounces in the ton, whilst the quartz itself, apart, perhaps, from an occasional speck of free gold, has proved entirely barren.

Although gold-bearing arsenical pyrites is very widely disseminated throughout the Hastings district, it appears to be more especially abundant in the eighth, ninth, tenth, and eleventh concessions of Marmora, in which it forms a series of roughly parallel zones, running in a general N.N.W. and S.S.E. direction, the course in most exposures being about N 20°—30°W. The gold-bearing ore consists of a mixture of arsenical pyrites and quartz, and it appears at first sight to be in the form of regular veins. This appearance, however, is probably deceptive, as the bands of ore run parallel with the stratification, and thus appear to be the analogues of the beds of magnetic iron ore which occur in these gneissoid rocks at other levels. It is not proposed in this communication to enter upon a discussion of their origin, but the inference may be hazarded that they will be found to be connected here and there with undoubted veins of similar composition. Their position in the locality more especially referred to here,—namely, in the more southern portions of the eighth, ninth, tenth and eleventh concessions of Marmora—is exhibited in the annexed general section.



In this section, the beds marked A are Laurentian strata, dipping, as regards the portion of country here shown, towards the west or south-west, but forming, actually, the eastern half of one of the numerous synclinal areas which occur throughout the Hastings country. The existence of these synclinals was intimated many years ago by Sir William Logan, but was first definitely established by the later researches of Mr. Vennor, of the Canadian Geological Survey. These Laurentian strata comprise, in this locality, a high ridge of syenitic rock, (marked H in the section) forming part of the so-called Huckleberry Mountains, or Red Hills of the district, and a succeeding series of gneissoid, ferruginous, and dolomitic beds, more or less hornblendic and micaceous. The Huckleberry ridge at this place, although apparently destitute in itself of stratification, is the axis of an anticlinal, separating the Marmora from the

Madoc synclinals. Under its western slope lies the belt of gold-bearing strata alluded to above. The strata marked B, are beds of horizontal or nearly horizontal Lower Silurian limestone, belonging to the base of the Trenton series. Marmora village is situated on these limestone strata, as at M in the section. Crow River, cutting through the limestones, and exposing the upturned edges of the underlying gneissoid rocks, is shown at C R; and the River Moira, here reduced to a comparatively small stream, is indicated by the initials R M. The observer, in reference to the section, is supposed to be facing the north.

Within the auriferous belt, lying, as remarked above, immediately west of the Huckleberry ridge, and extending roughly to a short distance beyond the line of the Moira, several well-defined bands of gold-holding arsenical pyrites have already been recognized, and the number will undoubtedly be increased as the country becomes more fully explored. These bands are apparently interstratified with the Laurentian strata, and consist essentially of mispickel associated with more or less quartz, although containing a certain admixture of iron pyrites, crystalline dolomite, fine particles of magnetic iron ore, and folia of brown and blackish-green mica. In some places, the foot-wall of these inclined bands of ore is marked by a layer of dark greyish-green talcose slate, and thinner layers of the same substance occasionally run parallel with the walls within the mass of the ore. The dip or underlie of these bands, following the dip of the strata, is necessarily towards the west, and at an average angle of about 30° or 35°. The principal bands of ore at present discovered, are known as the "Gatling vein," on lot 9 of the 8th concession; the "Gillan vein" on lot 6 of the same concession; the "Cook" or "Williams vein" on lot 7 of the 9th concession; and the "Feigel vein," on lot 16, concession 11. On the Gatling exposure, a large shaft has been sunk on the slope of the vein, to a depth of about sixty feet. At this depth, the band presents a width of at least sixteen feet, and is constantly yielding good shows of free gold. A fair sample of the ore gave me, by assay, an amount of gold equivalent to $112 per ton of 2000lbs; and a small piece of the mispickel, carefully separated from the accompanying quartz, &c., was found to contain the proportional amount of $156 per ton. The Gillan band, on lot 6, of the 8th concession, is of a very similar character, so far, at least, as regards its surface conditions; but it has only been

opened at present by a small excavation of a few feet in depth. In order to obtain an average sample, I had a couple of blasts put in, at a distance of about twelve feet apart, at the bottom of the excavation in question; and from the fragments thrown out by these shots, I broke off nearly 40 lbs. of ore, taking a piece or two from each fragment. A trial-assay, made on a small portion of the pure mispickel in which no trace of free metal could be detected, gave an equivalent in gold of no less than 8 ozs. 3 dwts., or $168, per ton; but portions taken fairly from the entire sample, and assayed side by side, gave the following results:

(1) Gold.....6 oz. 10 dwts. 16 grs.
Silver..... 0 oz. 9 dwts. 3 grs. } in ton of ore.

(2) Gold.....6 oz. 8 dwts. 8 grs.
Silver .....0 oz. 7 dwts. 20 grs. } in ton of ore.

Average amount of gold per ton (of 2000 lbs.) of ore=$133.28.

The Cook or Williams band is situated about a stone's throw east of the Gillan exposure, on lot 7, of the 9th concession. A shaft has been carried down along the slope of this to a depth of seventy feet or more, and some drifting has been run along the course of the band. The ore consists essentially of a mixture of mispickel and quartz, and the free gold in it has yielded in the mill, during the last two or three years, a pretty constant return of about nine or ten dollars per ton. A very large amount of its contained gold passes, however, into the waste slimes or tailings of the mill. I have assayed a good many samples of this ore, taken from different parts of the shaft and drifts. The lowest value obtained (per ton) was $25.30, and the highest, $71: the difference depending chiefly on the relative amounts of quartz and mispikel, the highest yields being invariably obtained from samples in which quartz was sparingly present. On one occasion, I took the trouble to separate as carefully as possible a considerable quantity of mispickel from its associated quartz, and I assayed the two separately, making duplicate assays in each case. The quartz yielded merely a trace of gold, the buttons on the cupels indicating by measurement (they were too small to be weighed) about $1\frac{1}{2}$ dwt. per ton; whilst the mean of the two mispickel assays showed 2 ozs. 19 dwts. 9 grs. of gold, and 2 dwts. 6 grs. of silver: or, in value, about $61 per ton. The so-called "Feigel mine" is situated on lot 16, of the 11th concession, on another metalliferous band of similar character. A considerable

amount of work has been done upon it, and some good, although fluctuating, mill-returns have been obtained from its ore.

In addition to these more prominent exposures, several other bands of intermixed gold-bearing mispickel and quartz are well known to occur within this area. It is evident, therefore, that an auriferous belt of great richness runs through this part of Marmora more especially; and from the constant occurrence of auriferous mispickel in other portions of the township, as well as in the adjacent townships of Madoc, Elzevir, &c., it may be legitimately inferred that the Hastings district is destined to take a leading rank at no distant day, among the recognised auriferous regions of the American continent. The chief obstacle, at present, to the working of the ore, is the difficulty involved in the extraction of its gold. The free gold can, of course, be separated more or less readily; but the gold present in the mispickel itself, is, I am convinced, in the form of an actual arsenide. Hence, whatever system be finally adopted for its extraction, the removal of the sulphur and arsenic must necessarily be resorted to as a preliminary operation; and, in reference to this, it cannot be too strongly enforced, that to subject the ore to an imperfect method of roasting is worse than useless. Any free gold that may be present is in that case almost inevitably arsenicised: and thus becomes entirely protected from the action of mercury or chlorine, the principal agents at present used in the separation of gold from associated rock matters. I have proved this abundantly by special experiments in the assay-furnace; and the same thing has been proved on a more practical scale by the abortive attempts made in Marmora and elsewhere to obtain gold from imperfectly roasted ores, whilst the same ores in their natural condition were constantly yielding, from their free gold, from five to eight pennyweights per ton.

*** In this communication, I claim to have made public the following facts: First, that in the Hastings region the mineral MISPICKEL is the true ore of gold; secondly, the existence of this gold-bearing mineral, in apparently inexhaustible quantities, throughout certain parts of the region in question; and, thirdly, the no less essential fact that free gold, if present in the ore, becomes arsenicised, and consequently lost, by imperfect methods of roasting.

UNIVERSITY COLLEGE, TORONTO.
May 17th, 1872.

LUNAR INFLUENCES.

BY THE REV. C. DADE, M.A.

NO. I.—SATURDAY MOON.

(Read before the Canadian Institute, February 3rd, 1872.)

Dr. Forester, of Bruges, in a communication some years since to the Astronomical Society, states that in a journal kept by himself, his father and his grandfather, from 1767 to 1849, every Saturday's new moon has been followed, nineteen times out of twenty, by twenty wet and windy days. A correspondent of the *Athenæum* has quoted several popular sayings to the same effect, as

> " Saturday's moon and Sunday's full
> Never was fair, and never wull."

and

> " If a Saturday's moon
> Come once in seven years it comes too soon."

Another correspondent says that he has heard it all his life from English, American, French and Spanish seamen, and once from a Chinese pilot. He added that he had himself constantly observed the phenomenon. A third again affirms that seamen would as soon sail on a Friday, as be in the Channel after a Saturday's moon. Accordingly, in a tale called " Winter Cruisings," published in the U. S. Journal for April, 1835, " Wad," the gunner, is introduced as saying, " Matter enough; it's a new moon on Saturday." " Is that all?" said his auditors, laughing. " Is that all?" repeated Mr. Wad, " I wish it were all, for I never knew a Saturday's moon without bad weather all the month. I know all the fisherman dread a Saturday's moon."

The late Prof. DeMorgan observes with respect to the above mentioned proverbs, " All this is curious, whether the thing is true or false." This we may readily admit, and may, perhaps, be disposed to class this opinion with that numerous tribe of superstitious dogmas of which our satellite is made the prolific mother. But, at the same time we must not forget that

> " There are more things in Heaven and earth, Horatio,
> Than are dreamt of in your philosophy."

Proverbs are the children of experience, the philosophy of the people. Various aphorisms have been handed down from time immemorial from father to son respecting the various phenomena around us, which, though couched in homely language, may contain the germ of some important truth. Surely it is not unreasonable to imagine that the life-long experience of men whose very lives and dearest interests are closely bound up with the watchful observance of phenomena daily and hourly forced upon their notice, must be entitled to some consideration. The shepherd on the hill, the hunter in the forest, the farmer in the field, the mariner on the deep, are from necessity practical philosophers; rude, perhaps, in speech, but not in knowledge.

The only sound and legitimate method of investigating the truth is, not by subtile theories and speculations, but by subjecting our theories to the test of experience, and building upon the solid foundation of accurate and long-continued observation.

The object of this paper is to give my experience, based on forty-one years of careful observation respecting the popular idea above alluded to, viz.: of the influence (if any) of a Saturday moon upon the weather. I have considered the circumstances of the weather for twenty days following the Saturday new and full moons, for their respective years from 1831 to 1871, both inclusive. The days marked *(f)* are intended to denote days without any gale, storm, or fall of rain sufficient to affect the rain guage. Snow and rain exceeding this amount, and all other phenomena of weather are classed under the heading *(s)*. There is a difficulty in this classification, as some days are styled *(s)* which scarcely can be considered more than variable; and thus more is carried to the moon's credit than she is really entitled to, which would suit the ideas of those who consider her responsible for every influence, from the perturbation of a planet to the derangement of a kettle of soap.

From the inspection of the annexed Table, we derive the following conclusions:

No. of Saturday full moons	71
" " new "	73
No. of fine days after full moon	972
No. of stormy " "	438
No. of fine days after new moon	1007
No. of stormy " "	461

Hence the number of fine days in the twenty days following the Saturday full moon=2·21 stormy; and similarly after the new= 2·18 stormy.

From this statement it appears that the results obtained, so far as Canada is concerned, are totally at variance with those arrived at by Dr. Forester, and also those popular opinions above alluded to embodied in proverbs current in the British Isles and elsewhere. Nor does this afford more than an apparent contradiction. What may be found true in the experience of the North Sea pilot or fisherman, contending day after day with hail, rain, fog, and stormy winds, in a climate, where, according to Havard, rain falls more or less every other day, can surely find no place in one like the Canadian, so opposite in all its features. Twenty wet and windy days after a Saturday moon is a phenomena not to be found in a climate where, for nearly five months in the year, little or no rain is met with, and where, in the summer months, an equal rainfall is so differently distributed. So far from the Saturday moons having anything formidable, they rather seem to be the harbingers of fine and serene weather. If we further examine the annexed table we shall find that in the years '35, '47, '52, '54, '58, '62, '64, '68, '69, there were three Saturday full moons and two Saturday new moons in the the year. And also that in the years 1834, '48, '56, '61, '65, there there were three Saturday new moons and two Saturday full. In the years '49, '53, '63, '70, there were no Saturday full moons, and in '33, 36, no Saturday new moons; but no year occurs in which both are found wanting. It is observable that the Saturday full moons in some degree seem to predominate.

Akin to the idea of a Saturday moon, of which the new, according to the popular notion, seems the most formidable, is that of the moon "on her back." Respecting which Jack's well-known adage will occur to our memories :—

> "When the moon is on her back,
> If near the shore, look out and tack."

Intimating that such an appearance is the precursor of a storm. In this opinion he is supported by the Red Indian of this country, who, it is said, is wont to remark that when you can hang a kettle on the moon's horn, it presages bad weather. To recount such sayings would be tedious and unprofitable, for their name is legion.

With respect to the crescent of the new moon, it always sets upon its back, and this is most observable in the spring of the year, when the declination of the growing moon is more northerly than that of the sun.

In respect to the various absurd ideas which we inherit from bygone ages, we may observe that Canada has had her full share of misrepresentation, and even at the hands of those from whom better things might have been expected. Steam, no doubt, has been a mighty instrument in dissipating error as well as in annihilating time and space, and bringing those together who were once put so far asunder. A few short years ago, this country was considered as a sort of Siberia, a region of frost and snow and thick ribb'd ice. This arose from the erroneous impressions caused by the early systems of geography formerly in use, and the absence of communication, and the scantiness of information respecting the country generally. The faulty notion respecting the climate alone, and which, no doubt, has had, and still has an injurious effect in retarding the progress of its settlement, is well known. Instances innumerable might be quoted on this head of climate in particular, which would form an apt appendage to Sir Thomas Brown's Book on "Vulgar Errors." Take the following example from Captain De Roos' Travels, p. 142, 143, published some years ago: "A friend of mine knew an instance of an ice-boat having crossed from York to Niagara (a distance of forty miles) in little more than three quarters of an hour." A statement not at all questioned by his reviewer, but matched by another drawing quite as literally upon the credulity of the reader. The celebrated Sydney Smith observes, "We might discover in Canada, or the West Indies, or the coast of Africa (mark the combination) a climate malignant enough or sufficiently sterile to avenge all the injuries inflicted on society by pickpockets, larcenists and petty felons."—*Ed. Review* for 1803.

In a speech made by the late Mr. Roebuck in the House of Commons, on the Hudson's Bay question, occurs the following passage:— "When it was said that much of this district was unfit for human habitation, it should be remembered that France and Gaul were once, in point of climate, what Canada is now . . . The description of Paris in the time of Julian might now very well be applied to Quebec, and if the same circumstances had taken place in Canada,

that country would be as flourishing and fertile as any in the world," The celebrated historian Allison, speaking on the same subject, observes, "In both provinces the same change has taken place which has been observed in Europe, and the climate every season becoming more mild, has undergone a change of 8° or 10° since the efforts of European industry were applied to the cultivation of their territory." If such an improvement upon the annual mean were likely to take place, we might surely look forward to halcyon days.

Without pursuing the subject further we have good reason to expect better views to prevail, especially since ample means have been afforded, both in material and men, of placing meteorological science on a firm basis, and in keeping pace with the spirit of the age, as far as Toronto is concerned. Many years ago, in a lecture delivered at Oakville, I took occasion to mention the excellent method adopted by the Regents of the High Schools in the State of New York, in requiring metrological reports from these institutions, and recommending the same plan. This, from whatever source, has been lately, to some extent carried out in Ontario. Without some such supplementary aid (for it is too much to expect that private individuals will put themselves to an outlay of time, cost and labor from a love of science in the abstract), any isolated efforts, however faithfully carried out, must necessarily be imperfect, and many important problems, for the solution of which long and widely extended observations, skilfully and energetically conducted, are indispensable, must remain undetermined.

TABLE.—(*Referred to at page* 336.)

	FULL MOONS.			NEW MOONS.		
YEARS.	NO.	F.	S.	NO.	F.	S.
1831	2	27	13	1	13	7
1832	1	13	7	2	23	17
1833	1	12	8	0	none	0
1834	2	28	12	3	40	20
1835	2	27	13	2	28	12
1836	1	13	7	0	none	
1837	2	26	14	1	12	8
1838	2	26	14	2	38	12
1839	1	14	6	2	absent	
1840	1	14	6	2	26	14
1841	2	23	17	2	28	12
1842	2	24	16	2	28	12
1843	1	14	6	3	38	7
1844	1	13	7	1	13	13
1845	2	45	15	2	25	8
1846	2	27	13	1	12	11
1847	3	39	21	2	29	11
1848	2	23	17	2	29	11
1849	0	absent		1	15	5
1850	1	15	5	2	29	11
1851	2	27	13	2	28	12
1852	3	43	17	2	28	12
1853	0	none		2	25	15
1854	3	44	16	2	24	16
1855	1	12	8	1	14	6
1856	2	30	10	3	41	19
1857	2	27	13	2	25	15
1858	3	38	22	2	29	11
1859	1	15	5	2	29	11
1860	2	31	9	2	27	13
1861	2	27	13	3	43	17
1862	3	40	20	2	29	11
1863	0	none		1	16	4
1864	3	44	16	2	34	6
1865	2	30	10	3	40	20
1866	1	13	7	1	14	6
1867	1	13	7	2	23	17
1868	3	44	16	2	29	11
1869	3	41	19	2	29	11
1870	0	none		2	25	15
1871	2	30	10	2	29	11

THE SCOTT CENTENARY.

[We here place on record two addresses which would have appeared in an earlier number of the *Canadian Journal*, had it been possible to find room for them.]

THE GENIUS OF SCOTT.

(An Address delivered by Prof. Daniel Wilson, LL.D., *at the Toronto Celebration of the Scott Centenary, 1871.)*

We meet to-day to mark with specially significant symbols the lapse of another century. Throughout the world-wide empire of our English race and tongue is being commemorated this day the fact that, one hundred years ago, there was born one whose genius has added to the world's intellectual wealth, to its higher aims and achievements, in lines of research undreamt of by him whose genius thus lighted the way. Born in an age of progress; in that era of revolution which shook the thrones of Europe to their foundations, and proclaimed in thunder peals of warning and of promise that "old things were passing away:" it was the specialty of Scott to be the minister of the old past. He was to sing "The Lay of the Last Minstrel," and tell the last Makar's tale; to fix in all the enduring beauty of a sun-picture, by the light of his genius, fashions of old times that were soon to become as obsolete for us as the era of the mastodon. In an age in which the furor of political and social reconstruction eradicated with indiscriminating waste all that was old and venerable for the very reason that it was so, Scotland produced this apostle of æsthetic conservatism. While philosophy, emancipated from the shackles of superstition, too frequently marshalled intellect in antagonism to all that is purest and noblest in the healthful instincts of the human soul, it was the fortune of Scott to be born in one of those virtuous households of the sober, sedate middle class of Presbyterian Scotland, so well described ere long in "The Excursion" of his great contemporary:—

> "Pure livers were they all, austere and grave,
> And fearing God; the very children taught
> Stern self-respect, a reverence for God's word,
> And an habitual piety, maintained
> With strictness scarcely known on English ground."

So the boy grew up in a healthy, kindly social element—not indeed to mature into the earnest piety, which, linked to his great genius, might have made of him another Knox, another Luther—"the solitary monk who shook the world;" but to exercise a very remarkable influence on its less vehement form of æsthetic veneration. He was an antiquary almost from his cradle; passionately conservative; venerated monks, minstrels, crusaders, kings; could see a certain poetry and beauty in the very Puritans that poets had loved to laugh at from the days of Ben Jonson to Butler; could discern how much that was heroic and chivalrous lurked under the rough home-spun of the peasant-martyrs of the

covenant; nay, at length, carried conservative veneration to such transcendental heights that, with a loyalty most genuinely devout, he bowed himself in the house of Rimmon, and did worship with an enthusiasm beyond all ridicule to that most unheroic embodiment of kingship, George the Fourth.

But the veneration which embraced with such devout comprehensiveness, elements so diverse, had its origin in higher sources than a mere antiquarian reverence for the past. Scott was a true poet. The dreams of his boyhood already bodied forth the forms of things unseen; and imagination busied itself with the fantasies of a world of its own creating. He lisped in numbers; and his biographer has preserved for us a kindly glimpse of old home sympathies amid which the young poet wrought. A little piece of verse, penned in a boyish hand, when but eleven years of age, was found after his death, folded up and inscribed in his mother's hand:—"*My Walter's first lines.*" Yet the vigorous, life-depicting powers, which were ere long to "hold as 'twere the mirror up to nature," were of no hot-bed prematurity of growth. His fine, spirited rendering of Bürger's strange weird ballad of *Lenore*—his true assay piece as a poet, was not produced until his twenty-sixth year. He was not forced into premature manhood like Scotland's great peasant; either by the harsh necessities of poverty, or by the overmastering temptations of unbridled passion. All his early surroundings were healthy and healthful; and he grew up that strange compound of shrewd, sagacious, worldly common-sense; and of romantic, visionary longings after a lost golden age of his own fancy's creation: which wrought for him and for us the heroic tragedy of his life.

As a poet, Scott has not only been eclipsed by the splendour of his more brilliant prose romance; but he continues even now to be estimated below his worth. He is a poet of the old Homeric school,—graphic, truthful, natural. His virtues and his faults alike protect him from the subtleties of that metaphysical school begot amid the throes of the French revolution,—including the greatest names among the poets of the past generation,—who seem all beset by the same strange desire to upbuild the whole philosophy of human thought, wrecked in the convulsions of that wild revolt, which has repeated itself in a communistic reign of terror under our own eyes. As a poet, Scott had none of the tragic earnestness and profundity of Shakspeare—with whom, in his prose writings, he is more fitly paralleled. But he has a true eye for all the pathos and sublimity of inanimate nature, and, with artistic power, recreates for us the vision of beauty: the streams and mountains of his native land; "Sweet Teviot by her silver tide;" or Ochil's mountains in the morning rays, when

> "As each heathy top they kissed
> It gleamed a purple amethyst."

And with all this was linked the passionate fervour of a warm Scottish heart, for which every rock and glen, every hill and valley of his native land was dear as the temple shrine of Jerusalem to the exiled Hebrew by the waters of Babylon.

A century unrivalled in heroic deeds and national triumphs, fills the completed cycle between that birth which we commemorate and this centenary day. The political map of Europe has been recast; its intellectual and moral statics have

undergone no less radical changes. Monarchies have become republics and republics empires. Philosophers and poets have triumphed in the intellectual arena; while soldiers have rivalled them in deeds on which the fate of nations hung. Patriots have recalled the acts of Wallace and Tell by like self-sacrificing heroism; and statesmen have been found equal to the perils of Europe's darkest hour. Yet among all who bore a part in this memorable century, Burns alone has yet challenged that recognition which with like cordiality we now accord to Scott.

It is well that Time's irrevocable flight should thus be associated with the noblest among those who have passed away. A hundred years ago, this birth-day which now, by acclamation of the civilized world,

> "In golden letters should be set
> Among the high tides in the calendar,"

had its interests limited to one little family circle in the College Wynd of old Edinburgh; as in some unheeded cradle now, perchance, lies the poet or the hero of the new century. Civic reform has swept away, not the house alone, but the antique wynd, from among the romantic sites of Scott's own romantic town; and the pilgrim has to seek his fitter memorial where the Tweed murmurs past Dryburgh's ruined aisle. He has gone to join the great immortals; but the world is richer by the Romancer's tale, and better for the Minstrel's lay. It is the fittest place to associate with the memory of him, who in an age of revolt against the effete relics of a worn-out feudalism, recalled it to a wise reverence for all that is noble and heroic in the past. It is a worthy shrine for Scotland's romantic poet, where, in his own native soil, and by the stream he loved so well, he is laid to rest under the ruined abbey, with the ashes of his sires, and the last of his line.

> "Call it not vain: they do not err
> Who say that when the poet dies
> Mute Nature mourns her worshipper,
> And celebrates his obsequies;
> Who say,—tall cliff and cavern lone
> For the departed bard make moan;
> That mountains weep in crystal rill;
> That flowers in tears of balm distil;
> And rivers teach their rushing wave
> To murmur dirges round his grave."

So the minstrel himself sang while life and hope were young; and when all its brightest visions had long faded into the light of common day, his final wish was gratified when the gentle ripple of the Tweed was alone audible as he breathed his last. To him, the idea—to which the Scot had yielded, under the schooling of stern necessity, in all ages—of emigration to such a land as this in which we now recall his name and fame, involved all that is most tragic in an enforced exile: and he gives expresson to it in words wonderfully suggestive to us now. As Fitz Eustace responds to Marmion's call for some lay to beguile the time, the poet exclaims:—

> "Such have I heard in Scottish land
> Rise from the busy harvest band,
> When falls before the mountaineer
> On lowland plain the ripen'd ear.

Oft have I listen'd and stood still
As it came softened up the hill,
And deem'd it the lament of men
Who languish'd for their native glen;
And thought how sad would be the sound
On Susquehannah's swampy ground,
Kentucky's wood-encumbered brake,
Or wild Ontario's boundless lake,
When heart-sick exiles in the strain
Recall'd fair Scotland's hills again."

And here now, by the shores of wild Ontario's boundless lake, in no swampy jungle or cumbered brake, but amid all the appliances of modern civilization, a century after that poet's birth, we recall fair Scotland's old historic landscape in association with the poet's name who in the young hey-day of pride and hope exclaimed in the familiar lines of his Minstrel:—

"Breathes there the man with soul so dead,
Who never to himself hath said:
This is my own, my native land?"

And in whom, more than a quarter of a century thereafter, returning from bootless wanderings, shattered alike in mind and body: the poet-soul of the Last of the Minstrels flashed up into momentary fire at the gleam of his native mountains and the music of his native stream.

As a poet, Scott occupied no mean place amid the galaxy of genius which marked his era with an intellectual wealth, surpassed only by that of the the Elizabethan age. As a novelist he remains unrivalled by all who have basked in the light of his genius, as by those whose works delighted elder generations with their gifted but impure romance. Yet looking to all that there was in Scott of masculine vigour, sagacious wisdom, shrewd practical sense, and genuine intellectual power, I cannot think he was true to the great gifts entrusted to him. He never "took unto the height the measure of himself," that, like Milton, he might create that which posterity would not willingly let die. Apollo's heavenly steed had been given to him, harnessed and bridled to his will, that he might soar to all the loftiest heights at his poetic behest. Apollo's lightnings had been entrusted to him in an age when millions of the embruted and down-trodden nations were longing and watching for the dawn. He dealt with the divine gift as though it were the merest merchandise of the trading mart; the paltry pelf of the exchequer; a means for accumulating acres, buildlng storehouses and barns; and creating the poor mockery of a modern antique: that melancholy anachronism of genius, the Barony of Abbotsford. No one saw the folly of all this more keenly than himself, or laughed at it in more genial and hearty fashion, as in his Baron of Bradwardine and Laird of Monkbarns. How was it that that shrewd, sagacious, thoroughly practical intellect succumbed to such folly? There are points in the inner life of the minstrel-novelist which have yet to be cleared up, ere he wholly cease to be for us still the Great Unknown. The secret of Scott's life has been purposely obscured. The laboured efforts of his biographer to shift on Ballantyne and others the blame of his bankruptcy and financial ruin have been seen through. But other points await the truthful handling of the impartial biographer

Pardon me if I detain you a moment to indicate what appears to me to be the key to all this misdirection of a great and noble genius. Scott was eminently domestic in his tastes; kindly, genial, replete with all hearty sociality. No pictures of domestic life are pleasanter than those in which we see him helping with simplest appliances the economic details of youthful house-keeping for his daughter and son-in-law. He seems the very man to have basked in the sunshine of the domestic hearth, and exclaimed with Burns :—

> "Princes and lords are but the breath of kings.
> An honest man's the noblest work of God."

How was it that he yielded to such enslavement of a false ambition; stooped from the lofty vocation of genius; and followed the *ignis fatuus* of a romantic dream to its bitter awakening? In his twenty-sixth year, when he had just produced his '*Lenore*'; but while, as yet, no one dreamt of the genius that lay concealed within him, we glean, from his own, and other letters, glimpses of an attachment to a lady of his own social circle, in whom, as by-and-by appeared, he had misconstrued friendly greetings into the response of love. She married another. The disappointed lover did as many another has since done: gulped down his agony in a long solitary ride,—through scenes afterwards immortalized in his 'Lady of the Lake;'—and, ere long, married in haste the first attractive woman he met: Miss Charlotte Margaret Charpentier, daughter of a French refugee. Unless I am deceived, I have seen and conversed with the lady of Scott's early love; a noble, high-principled woman, who "peradventure had she seen him first, might have made this, and that other world, another world for him." There is no time to dwell on this now. But enough is known—and much even may be gleaned amid all the reticence of Lockhart's biography,—to show how, cheated of the kindly simplicities of a domestic life most suited to his genial nature, Scott yielded to the dream of his later fancies, and sold his birthright of genius for the tawdry shams of Rouge Dragon and the Lord Lyon King of an obsolete pedantry.

Amid all his undoubted estimation of fame at its full worth, Scott wrote with no lofty aim; scarcely with a higher purpose than to please others, and make money for himself; and yet his great genius could not remain inoperative on his own, or on later ages. It is wonderful indeed, considering how poor was the aim he consciously set before himself, how great have been the fruits of his genius. It is difficult for us now fully to realize all that that elder generation felt and enjoyed in the resuscitation of the old life of by-gone centuries which Scott wrought for them. The literature of which it is the type is wholly the creation of his genius. As when Columbus had opened up the gates of the West, and revealed this long lost Atlantis to the men of his time, it was easy to follow in his wake; so this master's art is now free to all; and the modern apprentice has already forgotten to whom it is due. The old past appeared before that young present with a life as vigorous as its own. There they were; the old knights and dames, minstrels and men-at-arms, rough moss-troopers, gay cavaliers, grim roundheads and covenanters; royal crusader and sturdy com moner alike, in all the hardy naturalness of life. It was a world of literature as new and as real as that world which Columbus gave to Leon and Castile. How

much we owe to this is now dificult to exaggerate. A truth simple, but long forgotten flashed conviction into the minds of all men that history is the past-deeds of living men; that the past was once a living present like our own. To Scott we owe the wonderful vitality of modern history. Hallam, Macaulay, Carlyle, Motley, Froude, have all kindled their torch at the same lambent flame. And to him is no less due the wonderful living spirit of modern archæology. Antiquarian research is no longer the old Dryasdust of trifling dilettanteism; but the enlightened handmaid of history. Nay more: with that reanimation of old borderers and cavaliers, of knights and crusading barons, began the faith in the possibility of a resuscitated past, which has led us back, step by step, from historic to prehistoric man: Lyell and Huxley, Lubboch and Worsaae, De Perthes, Keller, Morlot and Lartet have each caught inspiration from the genius of Scott; and learned

> "To seize events as yet unknown to man,
> And dart his soul into the dawning plan:"

It was the wonderful blending of the poet and the antiquary;—things previously deemed more irreconcileable than fire and water,—which thus breathed life into the dead ashes of the past, and lifted for us the hoary skirts of time. All this and much more we owe to the genius of Scott. A poet of the old Homeric school, a brother of the free minstrel of the brookside and public highway, of the genial sunshine of human sympathy; he not only rejected the subtieties of Coleridge's and Shelley's metaphysical verse, and the morbid anatomisings of Byron's subjecive mind and vicious heart; but he breathed into the literature of fiction a healthful moral atmosphere which has revolutionized the republic of letters far more thoroughly than all the changes yet wrought on the body politic. To his healthful sympathies the quiet glow of the sunset was grander than the lurid blaze of the lightning, and the rosy gleam of the dawn or the broad beauty of the noon more impressive than the tempest's gloom. His antique fancies blended harmoniously with his pure poetic taste, and made him delight in reanimating the living landscape with a life of the past as real and vital as its own. Should the influences of this centenary celebration revive the study of Scott as a poet, it will not lead to any exaggerated estimate of his worth, for as such he can claim no place alongside of the few great poets of all time; but it will recall us to the familliar study of one who had a true poet's eye for the beauty and the poetry of simple nature; the beauty and the poetry that lie about us all, here and everywhere, had we but, like him, "the vision and the faculty divine." And if such be the case it will supply an antidote not wholly unneeded in the age which rejoices in the genius of Browning and Tennyson.

Such, however inadequately presented to you, are some of the enduring influences which we owe to the genius of Scott: and therefore it is fitting that here, in the capital of this young Canadian province, as throughout the world-wide empire won to itself by the Anglo-Saxon race; and beyond it in other lands and among other tongues; we gather to commemorate the birth, one hundred years ago, of one who, by his writings, has added to the world's true wealth, an El Dorado more precious than that of Ophir or Peru; by the

enkindling power of his genius has revealed to younger generations realities more marvelous than all the wonders of romance; and lighted the way to substantial triumphs grander than the brightest dreams of Faerie Minstrelsy.

THE LAMPS OF FICTION.

(An Address delivered by Prof. Goldwin Smith, *at the Toronto Celebration of the Scott Centenary, 1871.)*

Ruskin has lighted seven lamps of Architecture, to guide the steps of the architect in the worthy practice of his art. It seems time that some lamps should be lighted to guide the steps of the writer of Fiction. Think what the influence of novelists now is, and how some of them use it. Think of the multitudes who read nothing but novels; and then look into the novels which they read. I have seen a young man's whole library consisting of thirty or forty of those paper-bound volumes, which are the bad tobacco of the mind. In England I looked over three railway book-stalls in one day. There was hardly a novel by an author of any repute on one of them. They were heaps of nameless garbage, commended by tasteless, flaunting woodcuts, the promise of which was no doubt well kept within. Fed upon such food daily, what will the mind of a nation be? I say that there is no flame at which we can light the Lamp of Fiction purer or brighter than the genius of him in honour to whose memory we are assembled here to-day. Scott does not moralize. Heaven be praised that he does not. He does not set a moral object before him, nor lay down moral rules. But his heart, brave, pure and true, is a law to itself; and by studying what he does we may find the law for all who follow his calling. If seven lamps have been lighted for architecture, Scott will light as many for fiction.

The Lamp of Reality.—The novelist must ground his work in a faithful study of human nature. There was a popular writer of romances, who, it was said, used to go round to the fashionable watering places to pick up characters. That was better than nothing. There is another popular writer who, it seems, makes voluminous indices of men and things, and draws on them for his material. This also is better than nothing. For some writers, and writers dear to the circulating libraries too, might, for all that appears in their works, lie in bed all day and write by night under the excitement of green tea. Creative art, I suppose, they call this, and it is creative art with a vengeance. Not so Scott. The human nature which he paints, he had seen in all its phases, gentle and simple; in burgher and shepherd, Highlander, Lowlander, Borderer and Islesman; he had come into close contact with it; he had opened it to himself by the talisman of his joyous and winning presence; he had studied it thoroughly with a clear eye and an all-embracing heart. And when his scenes are laid in the past, he has honestly studied the history. The history of his novels is, perhaps, not critically accurate, not up to the mark of our present knowledge, but in the main it is sound and true. Sounder and more true than that of many professed historians, and even than that of his own historical

works, in which he sometimes yields to prejudice, while in his novels he is lifted above it by his loyalty to his art.

The Lamp of Ideality.—The materials of the novelist must be real; they must be gathered from the field of humanity by his actual observation. But they must pass through the crucible of the imagination; they must be idealized. The artist is not a photographer, but a painter He must depict not persons but humanity, otherwise he forfeits the artist's name, and the power of doing the artist's work in our hearts. When we see a novelist bring out a novel with one or two good characters, and then, at the fatal bidding of the booksellers, go on manufacturing his yearly volume, and giving us the same character or the same few characters over and over again, we may be sure that he is without the power of idealization. He has merely photographed what he has seen, and his stock is exhausted. It is wonderful what a quantity of the mere lees of such writers, more and more watered down, the circulating libraries go on complacently circulating, and the reviews complacently reviewing. Of course, this power of idealization is the great gift of genius. It is that which distinguishes Homer, Shakespeare, and Walter Scott from ordinary men. But there is also a moral effort in rising above the easy work of mere description to the height of heart. Need it be said that Scott is thoroughly ideal as well as thoroughly real? There are vague traditions that this man and the other was the original of some character in Scott. But who can point out the man of whom a character in Scott is a mere portrait? No more than you can point out a case of servile delineation in Shakespeare. Scott's characters are never monsters or caricatures. They are full of nature; but it is universal nature. Therefore they have their place in the universal heart, and will keep that place for ever. And mark that even in his historical novels he is still ideal. Historical romance is a perilous thing. The fiction is apt to spoil the fact, and the fact the fiction; the history to be perverted and the romance to be shackled; daylight to kill dreamlight, and dreamlight to kill daylight. But Scott takes few liberties with historical facts and characters; he treats them with the costume and the manners of the period, as the background of the picture. The personages with whom he deals freely are the Peverils and the Nigels; and these are his own lawful property, the offspring of his own imagination, and belong to the ideal.

The Lamp of Impartiality.—The novelist must look on humanity without partiality or prejudice. His sympathy, like that of the historian, must be unbounded, and untainted by sect or party. He must see everywhere the good that is mixed with evil, the evil that is mixed with good. And this he will not do unless his own heart is right. It is in Scott's historical novels that his impartiality is most severely tried and is most apparent; though it is apparent in all his works. Shakespeare was a pure dramatist; nothing but art found a home in that lofty, smooth idealistic brow. He stands apart not only from the political and religious passions but from the interests of his time, hardly seeming to have any historical surroundings, but to shine like a planet suspended by itself in the sky. So it is with that female Shakespeare in miniature, Miss Austen. But Scott took the most intense interest in the political

struggles of his time. He was a fiery partisan; a Tory in arms against the French Revolution. In his account of the coronation of George IV. a passionate worship of monarchy breaks forth, which, if we did not know his noble nature, we might call slavish. He sacrificed ease, and at last life, to his feudalistic aspirations. On one occasion he was even carried beyond the bounds of propriety by his opposition to the Whig chief. The Cavalier was his political ancestor, the Covenanter the ancestor of his political enemy. The idols which the Covenanting iconoclast broke were his. He would have fought against the first revolution under Montrose, and against the second under Dundee. Yet he is perfectly, serenely just to the opposite party. Not only is he just, he is sympathetic. He brings out their work, their valour, such grandeur of character as they have, with all the power of his art, making no distinction in this respect between friend and foe. If they have a ridiculous side he uses it for the purposes of his art, but genially, playfully, without malice. If there was a laugh left in the Covenanters, they would have laughed at their own portraits as painted by Scott. He shows no hatred of anything but wickedness itself. Such a novelist is a most effective preacher of liberality and charity: he brings our hearts nearer to the Impartial Father of us all.

The Lamp of Impersonality.—Personality is lower than partiality. Dante himself is open to the suspicion of partiality: it is said, not without apparent ground, that he puts into hell the enemies of the political cause which, in his eyes, was that of Italy and God. A legend tells that Leonardo da Vinci was warned that his divine picture of the Last Supper should fade, because he had introduced his personal enemy as Judas, and thus desecrated art by making it serve personal hatred. The legend must be false. Leonardo had too grand a soul. A wretched woman in England, at the beginning of the last century, Mrs. Manley, systematically employed fiction as a cover for personal libel; but such an abuse of art as this could be practised or countenanced only by the vile. Novelists, however, often debase fiction by obtruding their personal vanities, favouritisms, fanaticisms and antipathies. I saw, the other day, a novel, the author of which brings himself in almost by name as a heroic character, with a description of his own personal appearance, residence, and habits, as fond fancy paints them to himself. There is a novelist, who is a man of fashion, and who makes the age of the heroes in his successive novels advance with his own, so that at last we shall have irresistible fascination at four score years and ten. But the commonest and the most mischievous way in which personality breaks out is pamphleteering under the guise of fiction. One novel is a pamplet against lunatic asylums, another against model prisons, a third against the poor law, a fourth against the government offices, a fifth against trades' unions. In these pretended works of imagination, facts are coined in support of a crotchet or antipathy with all the license of fiction; calumny revels without restraint, and no cause is served but that of falsehood and injustice. A writer takes offence at the excessive popularity of athletic sports; instead of bringing out an accurate and conscientious treatise to advocate moderation, he lets fly a novel, painting the typical boating man as a seducer of confiding women, the betrayer of his friend, and the murderer of his

wife. Religious zealots are very apt to take this method of enlisting imagination, as they think, on the side of truth. I remember a high Anglican novel in which the Papist was eaten alive by rats, and the Rationalist and Republican were slowly scathed in molten lead, the fate of each being, of course, a just judgment of heaven on those who presumed to differ from the author. Thus the voice of morality is confounded with that of tyrannical petulance and self-love. Not only is Scott not personal, but we cannot conceive his being so. We cannot think it possible that he should degrade his art by the indulgence of egotism, or crotchets, or petty piques. Least of all can we think it possible that his high and gallant nature should use art as a cover for striking a foul blow.

The Lamp of Purity.—I heard Thackeray thank Heaven for the purity of Dickens. I thanked Heaven for the purity of a greater than Dickens, Thackeray himself. We may all thank Heaven for the purity of one still greater than either, Sir Walter Scott. I say still greater morally, as well as in power as an artist, because in Thackeray there is cynicism, and cynicism, which is not good in the great writer, becomes very bad in the little reader. We know what most of the novels were before Scott. We know the impurity half-redeemed of Fielding, the unredeemed impurity of Smollett, the lecherous leer of Sterne, the coarseness even of Defoe. Parts of Richardson himself could not be read by a woman without a blush. As to French novels, Carlyle says of one of the most famous of the last century that after reading it you ought to wash seven times in Jordan; but after reading the French novels of the present day, in which lewdness is sprinkled with sentimental rosewater, and deodorized but by no means disinfected, your washings had better be seventy times seven. There is no justification for this; it is mere pandering, under whatever pretences to evil propensities; it makes the divine art of Fiction procuress to the Lords of Hell. If our established morality is in any way narrow and unjust, appeal to Philosophy, not to Comus; and remember that the mass of readers are not philosophers. Coleridge pledges himself to find the deepest sermons under the filth of Rabelais; but Coleridge alone finds the sermons while everybody finds the filth. Impure novels have brought and are bringing much misery on the world. Scott's purity is not that of cloistered innocence and inexperience. It is the manly purity of one who had seen the world, mingled with men of the world, known evil as well as good; but who being a true gentleman abhorred filth, and teaches us to abhor it too.

The Lamp of Humanity.—One day I see our walls placarded with the advertising woodcut of a sensation novel, representing a girl tied to a table and a man cutting off her feet into a tub. Another day we are allured by a picture of a woman sitting at a sewing-machine and a man seizing her behind by the hair, and lifting a club to knock her brains out. A French novelist stimulates your jaded palate by introducing a duel fought with butchers' knives by the light of lanterns. One genius subsists by murder, as another does by bigamy and adultery. Scott would have recoiled from the blood as well as from the ordure; he would have allowed neither to defile his noble page. He knew that there was no pretence for bringing before a reader what is merely horrible;

that by doing so you only stimulate passions as low as licentiousness itself; the passions which were stimulated by the gladiatorial shows in degraded Rome, which are stimulated by the bull-fights in degraded Spain; which are stimulated among ourselves by exhibitions the attraction of which really consists in their imperilling human life. He knew that a novelist had no right even to introduce the terrible except for the purpose of exhibiting human heroism, developing character, awakening emotions, which when awakened dignify and save from harm. It is want of genius and of knowledge of their craft that drives novelists to outrage humanity with horrors. Miss Austen can interest and even excite you as much with the little domestic adventures of Emma as some of her rivals can with a whole Newgate calendar of guilt and gore.

The Lamp of Chivalry.—Of this briefly. Let the writer of fiction give us humanity in all its phases, the comic as well as the tragic, the ridiculous as well as the sublime; but let him not lower the standard of character or the aim of life. Shakespeare does not. We delight in his Falstaffs and in his clowns as well as in his Hamlets and Othellos; but he never familiarizes us with what is base and mean. The noble and chivalrous always holds its place as the aim of true humanity in his ideal world. I am not sure that Dickens is free from blame in this respect; that Pickwickianism has not in some degree familiarized the generation of Englishmen who have been fed upon it with what is mean,—not chivalrous, to say the least—in conduct, as well as with slang in conversation. But Scott, like Shakespeare, wherever the thread of his fiction may lead him, always keeps before himself and us the highest ideal which he knew—the ideal of a gentleman. If anyone says these are narrow bounds wherein to confine fiction, I answer there has been room enough within them for the highest tragedy, the deepest pathos, the broadest humour, the widest range of character, the most moving incidents that the world has ever enjoyed. There has been room within them for all the kings of pure and healthy fiction,—for Homer, Shakespeare, Cervantes, Molière, Scott. "Farewell, Sir Walter," says Carlyle at the end of his essay, "farewell, Sir Walter, pride of all Scotchmen." Scotland has said farewell to her mortal son. But all humanity welcomes him as Scotland's noblest gift to her, and crowns him, as on this day, one of the heirs of immortality.

THE LATE REV. CHARLES DADE.

The late Rev. Charles Dade, of Georgetown, Esquesing, was a man of unusual attainments in science and general learning. At the University of Cambridge he obtained a high wrangler's degree in the Mathematical Tripos, distinguishing himself also, at the same time, in a marked manner, in the examination for Classical Honours. This was in 1825, "Challis's Year;" the year when Challis, the still surviving Plumian Professor of Astronomy in the University of Cambridge, was senior wrangler. Immediately after obtaining his degree, Mr. Dade was elected a fellow of Gonville and Caius College, where, as the lists show, several of his own name had preceded him in that honourable position. In 1826 he gained the "Members' Prize," a distinction greatly desired at Cambridge, and attained only by first-rate scholars. It is one of four annual prizes, given by the Representatives in Parliament of the University, for Dissertations in Latin Prose, which are read publicly by the prizemen in the Senate-house on a day appointed near to the Commencement. In the catalogue of Members' Prizemen are, in recent years, the names of Hugh James Rose, Scholefield, George Long, Howson, A. J. B. Hope, Ellicott, &c. Mr. Dade's Essay was afterwards printed in full, in the *Classical Journal* for March and June, 1827, published by A. J. Valpy, London. Prior to his appointment in 1829, as Mathematical Master in Upper Canada College, Mr. Dade had been connected with Elizabeth College, Guernsey, where he attracted the notice of Sir John Colborne, who was, at the time, Lieutenant Governor of Guernsey.

The early alumni of Upper Canada College will have observed, not without emotion, the decease of their old instructor. His memory will continue to be to them in the future, what in every review of the past it has already been, one of their valued recollections. Again and again have they discovered by experience that the foundations of science laid in their minds by their first master in mathematics, were solid and trustworthy. Again and again, in their intercourse with men, have they felt the abiding effect for good on themselves, of the sterling honesty and blunt straightforwardness which so conspicuously characterized their former guide and friend. Perhaps, in the severe temperature of the "Mathematical Master's room," in the olden time, kept in winter, as will be remembered, as little above freezing as possible, some of our eminent engineers and explorers of new districts had tested for the first time that power of endurance, and that capacity for solving problems under difficulties, which have contributed to their success; a power and a capacity brought prominently out, perhaps also for the first time, in some one or other of the memorable tramps laboriously undertaken on the ice of Toronto bay, or elsewhere, in company with their iron-sinewed teacher, whilst being shown by him practically how to run base-lines and take angles, and measure the altitude of the sun and other objects. Besides being a vigorous and accurate thinker, Mr. Dade was, to the close of his career, an indefatigable and very literal manual worker. On his farm near Oakville, to which he withdrew when he resigned his mastership in Upper Canada College

about the year 1837, some very remarkable trenches and dykes for drainage purposes, excavated by the might of his own arm, will be recalled.

Papers of permanent value, by Mr. Dade, on the Law of Storms, and on the Cholera Seasons of 1832 and 1834, are preserved in Volumes five and seven, respectively, of the second series of the *Canadian Journal*. A note by him on some Indian remains in the township of Beverley, in Volume one of the first series of the same journal, is characteristic for its brevity and directness; suggestive, in its style, of letters from scientific country clergymen to Sylvanus Urban, in the palmy days of that early promoter of useful knowledge. A valuable contribution on the Meteorology of Toronto and its vicinity, by the same hand, was also very recently communicated to the Canadian Institute. Mr. Dade's Tables of Observations on our local physical phenomena, carefully made from 1831 downwards, are held by the authorities at the Toronto Observatory to be of special importance, as appertaining to a period of which no other records of the kind are extant. Mr. Dade died on the morning of the 2nd instant (May, 1872), at his residence in Georgetown, Esquesing, in his 70th year, having been born June 20th, 1802,—at Yarmouth, in Norfolk. Soon after his retirement from Upper Canada College, he married a daughter of the Rev. Dr. Phillips, formerly Vice-Principal of that institution. At Oakville, Stewartown and Georgetown, he undertook, without emolument, occasional clerical duty, and devoted a portion of his time to the preparation of young men for the Universities, &c.

The prize dissertation above referred to fills sixteen closely-printed octavo pages in the *Classical Journal*. It is an admirably-sustained discussion, in pure, easy-flowing Latin, of the most striking points in which modern men have the advantage of their predecessors in the by-gone ages. (Quibusnam præcipue artibus recentiores antiquos exsuperant?) It is thrown into the form of a conversation between the author and a friend; in the manner of Cicero. The friend is a Q. Cæpio. (The name Cæpio occurs in the De Finibus.) His character is thus drawn: "Erat autem is Cæpio, qui naturalem suam ingenii bonitatem, assidua exercitatione et probatissimorum scriptorum tractatione ita perpolierat, ut difficile pronunciatu esset, doctrinæ ubertate magis an judicii subtilitate præstaret. Neque ille, uti multorum mos est, nihil nisi quod sacrarat antiquitas admirari, neque se recentiorum terminis circumscribere solebat sed nova cum veteribus comparando, quid in quoque genere optimum esset studiose anquirere." The first portion of the conversation is supposed to be carried on between the friends while walking up and down together on the sea-shore, after supper. The scene is thus described: "In marinum littus concessimus (distat enim non longe a Cæpionis villa), et lentis ibi passibus progredientes, Lunæ in placido æquoris sinu dormientis mite et tremulum jubar, cœlumque stellis undique ardentibus illuminatnm, taciti per aliquod tempus contemplati sumus, dum fluctuum littoribus alludentium strepitus grato murmure mulcebat aures." For the second portion of the conversation the friends adjourn to the house: "Sed visne," Cæpio says, "quoniam satis quidem, ut opinor, ambulatum est, et vespertina hæcce frigora, ut ait poeta, parum cautos lædere solent, locum mutemus, quodque reliquum est hujus quæstionis intra domesticos parietes conficiamus? Quæ cum dixisset, domum revertimus et posteaquam nos in cœnaculum contulissemus,

ibique consedissemus, tum Cæpio; Jam gravioribus," &c. After a masterly comparison of the condition in early ages of Philosophy, Natural and Moral, of Science, Inventions, Arts, Historical Composition, Criticism, Oratory, Poetry, Painting Sculpture, Architecture and Music, with the same things in later times, conclusions are arrived at in these words: "Ex rationibus igitur nostris hoc liquido constare arbitror, antiquitas palmam tribuendam esse in iis disciplinis, quæ ingenio et humaniorum studiorum facultate continentur; contra recentiori ætati in iis, quæ observandi diuturnitate, et investigandi diligentia, ex abditis Naturæ fontibus hauriuntur." The modern application of steam, especially in navigation, is thus classically described: "Quanta vero rerum miracula ex aquæ vaporis usu nostra patrumque ætas machinata vidit! quæ perfecto mecum ipse reputans, vix admiratione satiari possum. Nam ut alia omittam omnia, quid hoc magnificentius excogitari queat, homines rem istam, qua nihil levius aut inanius est, ita arte sua ingenioque moderare potuisse, ut quas res Natura violentissimas genuit, earum dominatum tenentes, nullis non modo ventorum ac remigio præsidiis adjuti, verum etiam adversus omnem maris ventorumque rabiem quem sibi proposuere portum, tuto eundem et facile consequi valerent. Quid enim hoc aliud est, nisi Naturæ ipsi vim inferre, aut novam quasi Naturam in rebus efficere?" In a passage which treats of the poets, we observe "Shakspeare" ingeniously metonymised into "Enchespalus,"—the Homeric Εγχέσπαλος, Spear-brandishing. EDITOR.

[The Proceedings of the Canadian Institute will be concluded in the next number of the *Journal.*]

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

BY THE REV. DR. SCADDING.

XLVI.—YONGE STREET—FROM CARLETON STREET TO YORKVILLE—(*Continued*).

The residue of the Sandhill-rise that is still to be discerned westward of Yonge Street has its winsome name, Clover Hill, from the designation borne by the home of Captain Elmsley, son of the Chief Justice, situate here. The house still stands, over-shadowed by some fine oaks, relics of the natural woods. The rustic cottage-lodge, with diamond-lattice windows, at the gate leading in to the original Clover Hill, was on the street a little further on. At the time of his decease, Captain Elmsley had taken up his abode in a building apart from the principal residence of the Clover Hill estate; a building to which he had pleasantly given the name of Barnstable, as being in fact a portion of the outbuildings of the homestead turned into a modest dwelling.—Barnstable was subsequently occupied by Mr. Maurice Scollard, a veteran attaché of the Bank of Upper Canada, of Irish birth, remembered by all frequenters of that institution, and by others for numerous estimable traits of character, but especially for a gift of genuine quiet humour and wit, which at a touch was ever unfailingly ready to manifest itself in word or act, in some unexpected, amusing, genial way. Persons transacting business at the India House in London, when Charles Lamb was a book-keeper there, must have had the solemn routine of the place now and then curiously varied by a dry "aside" from the direction of his desk. Just so the habitués of the old Bank, when absorbed in a knotty question of finance, affecting themselves individually, or the institution, would oftentimes find themselves startled from their propriety by a droll view of the case, gravely suggested by a venerable personage sure to be somewhere near at hand busily engaged over a huge ledger.

They who in the mere fraction of a lifetime have seen in so many places the desert blossom as the rose, can with a degree of certainty, realize in their imagination what the whole country will one day be, even portions of it which to the new comer seem at the first glance very unpromising. Our Sandhill here, which but as yesterday we beheld in its primeval condition, with no trace of human labour upon it except a few square yards cleared round a solitary Indian grave, to-day we see crowned along its crest for many a rood eastward and westward with comfortable villas and graceful pleasure-grounds. The history of this spot may serve to encourage all who at any time or anywhere are called in the way of duty to be the first to attack and rough-hew a forest-wild for the benefit of another generation. If need were to stay the mind of a newly-arrived immigrant friend wavering as to whether or not he should venture permanently to cast in his lot with us, we should be inclined to direct his regards, for one thing, to the gardens of an amateur, on the southern slope of the rise, at which we are pausing, where choice fruits and flowers are year after year produced equal to those grown in Kent and Devon; we should be inclined to direct his regards, perhaps likewise, to the amateur cultivator himself of those fruits and flowers, Mr. Phipps—a typical Englishman after a residentership in York and Toronto of half a century.

On p. 267, the substance of the last ten lines of the upper paragraph relating to Mr. Durand, sen., should be modified as follows:—Nearly the whole of the eastern moiety of the present city of Hamilton was originally his. He represented the united counties of Wentworth and Halton in several Parliaments up to 1822. A political journal, entitled *The Bee*, moderate and reasonable in tone, was, up to 1812, edited and published by him in the Niagara District. Mr. Durand,

senior, died in 1833, at Hamilton, where he filled the post of County Registrar. His eldest son Mr. James Durand, when, in 1817, member for Halton, enjoyed the distinction of being expelled from the House of Assembly. A Parliament had just expired. He offered some strictures on its proceedings, in an address to his late constituents. The new House, which embraced many persons who had been members of the previous Parliament, was persuaded to vote the Address to the electors of Halton a libel, to exclude its author from the House, and to commit him to prison. His instant re-election by the county of Halton was of course secured. We observe from the evidence of Mr. James Durand before the celebrated Grievance Committee of 1835, that he was an early advocate of a number of the changes which have since been carried into effect. This Mr. Durand died in 1872 at Kingston, where he was Registrar for the County of Frontenac. We have been enabled to make the corrections now given through the kindness of Mr. Charles Durand, who, in a valuable communication, further informs us that besides being among the earliest to engage in mercantile enterprise in Upper Canada, his father had also in 1805 a large interest in the extensive flour mills in Chippewa, known as the Bridgewater Mills: mills burnt by the retreating American army in 1812, at which period Mr. Durand, senior, was in the command of one of the flank companies of Militia, composed of the first settlers in the neighbourhood of the modern Hamilton: moreover he was the first who ever imported fox-hounds into Upper Canada, a pack of which animals he caused to be sent out to him from England, being fond of the hunter's sport. With these he hunted near Long Point, on Lake Erie, in 1805, over a region teeming at the time with deer, bears, wolves and wild turkeys. Mr. Peter Des Jardins, from whom the Dundas Canal has its name, was in 1805, a clerk in the employment of Mr. Durand.

But to push now on our way. To the north of our Sandhill, a short distance, on the east side, was a sylvan halting place for weary teams, known as the Gardeners' Arms. It was an unpretending rural wayside inn, furnished with troughs and pump. The house lay a little way back from the road. Its sign exhibited an heraldic arrangement of horticultural implements. Another rural inn, with homely name, might have been noted, while we were nearer Lot Street: the Green Bush Tavern. But this was a name transferred from another spot, far to the north on Yonge Street, when the landlord, Mr. Abrahams, moved into town. In the original locality, the sign was a painted pine-tree or spruce of formal shape—not the ivy-bush, the sign referred to by the ancient proverb when it said, "Wine needeth it not"—"Vino vendibili non opus est suspensa hedera."

On the right, beyond the Gardeners' Arms, appeared in this region at an early date, at a considerable distance from each other, two or perhaps three flat, single-storey square cottages, clapboarded and painted white, with flat four-sided roofs, door in the centre and one window on either side: little wooden boxes set down on the surface of the soil apparently, and capable, as it might seem, of being readily lifted up and transported to any other locality. They were the first of such structures in the outskirts of York, and were speedily copied and repeated in various directions, being thought models of neatness and convenience. Opposite the quarter where these little square hutches were to be seen, there are to be found at the present day, the vineyards of Mr. Bevan; to be found, we say, for they are concealed from the view of the transient passenger by intervening buildings. Here again we have a scene presenting a telling contrast to the same spot and its surroundings within the memory of living men: a considerable area covered with a labyrinth of trellis work, all overspread with hardy grapes in great variety and steadily productive. To this sight likewise we should introduce our timid, hesitating new comer, as also to the originator of the spectacle—Mr. Bevan, who after a forty-years' sojourn in the vicinity of York and Toronto, continues as genuinely English in spirit and tone now, as when he first left the quay of his native Bristol for his venture westward. While engaged largely in the manufacture of various articles of wooden ware, Mr. Bevan adopted as a recreation the cultivation of the grape, and the making of a good and wholesome wine. It is known in commerce and to physicians, who recommend it to invalids for its real purity, as Clintona.

Just before reaching the first concession-road, where Yorkville now begins, a family residence of an ornamental suburban character, put up on the left by Mr. Lardner Bostwick, was the first of that class of building in the neighbourhood. His descendants still occupy it. Mr. Bostwick was an early property owner in York. The now important square acre at the south-east angle of the intersection of King Street and Yonge Street, regarded probably when selected, as a

mere site for a house and garden in the outskirts of the town, was his. The price paid for it was £100. Its value in 1872 may be £100,000.

The house of comparatively modern date, seen next after Mr. Bostwick, is associated with the memory of Mr. de Blaquiere, who occupied it before building for himself the tasteful residence, not far off, where he died; now the abode of Mr. John Heward. Mr. de Blaquiere was the youngest son of the first Lord de Blaquiere, of Ardkill, in Ireland. He emigrated in 1837, and was subsequently appointed to a seat in the Legislative Council of Upper Canada. In his youth he had seen active service as a midshipman. He was present at the battle of Camperdown in the *Bounty*, commanded by Captain Bligh. He was also in the Fleet at the Nore during the mutiny. He died suddenly here in his new house in 1860, aged 76. His fine character and prepossessing outward physique are freshly remembered. Thus again and again have we to content ourselves with the interest that attaches not to the birth-places of men of note, as would be the case in older towns, but to their death-places. Who of those that have been born in the numerous domiciles that we pass are finally to be ranked as men of note, and as creators consequently of a sentimental interest in their respective birth-places, remains to be seen. In our portion of Canada there has been time for the application of the requisite test in only a very few instances.

XLVII.—YONGE STREET FROM YORKVILLE TO THE SECOND CONCESSION ROAD (DEER PARK).

The First Concession Road-line derived its modern name of Bloor Street from a former resident on its southern side, eastward of Yonge Street. Mr. Bloor, as we have previously narrated, was for many years the landlord of the Farmers' Arms, near the market place of York, an inn conveniently situated for the accommodation of the agricultural public. On retiring from this occupation with a good competency, he established a Brewery on an extensive scale in the ravine north of the first concession road. In conjunction with Mr Sheriff Jarvis, he entered successfully into a speculation on land, projecting and laying out the village of Yorkville, which narrowly escaped being Bloorville. That name was proposed: as also was Rosedale, after the Sheriff's homestead; and likewise "Cumberland," from the county of some of the surrounding inhabitants. The monosyllable "Blore" would have sufficed, without having recourse to a hackneyed suffix. That is the name of a spot in Staffordshire, famous for a great engagement in the wars between the Houses of Lancaster and York. But Yorkville was at last decided on, an appellation preservative in part of the name just discarded in 1834 by Toronto. Mr. Bloor was an Englishman, respected by every one. That his name should have become permanently attached to the Northern Boulevard of the City of Toronto, a favourite thoroughfare, several miles in extent, is a curious fact which may be compared with the case of Pimlico, the famous west-end quarter of London. Pimlico has its name, it is said, from Mr. Benjamin Pimlico, for many years the popular landlord of a hotel in the neighbourhood. Bloor Street was for a time known as St. Paul's road: also as the Sydenham road.

While crossing the First Concession Line, now in our northward journey, the moment comes back to us when on glancing along the vista to the eastward, formed by the road in that direction, we first noticed a church-spire on the right-hand or southern side. We had passed that way a day or two previous, and we were sure no such object was to be seen there then; and yet, unmistakeably now, there rose up before the eye a rather graceful tower and spire, of considerable altitude, complete from base to apex, and coloured white. The fact was: Mr. J. G. Howard, a well-known local architect, had ingeniously constructed a tower of wood in a horizontal, or nearly horizontal, position in the ground close by, somewhat as a shipbuilder puts together "the mast of some vast ammiral," and then, after attending to the external finish of, at least, the higher portion of it, even to a coating of lime-wash, had, in the space of a few hours, by means of convenient machinery raised it on end, and secured it, permanently in a vertical position. We gather some further particulars of the achievement from a contemporary account. The Yorkville spire was raised on the 4th of August, 1841. It was 85 feet high, composed of four entire trees or pieces of timber, each of that length, bound together pyramidically, tapering from ten feet base to one foot at top, and made to receive a turned ball and weather-cock. The base was sunk in the ground until the apex was raised ten feet from the ground; and about thirty feet of the upper part of the spire was completed, coloured and

painted before the raising. The operation of raising commenced about 2 o'clock p.m., and about 8 in the evening, the spire and vane were seen erect, and appeared to those unacquainted with what was going on, to have risen amongst the trees, as if by magic. The work was performed by Mr. John Richey; the framing by Mr. Wetherell, and the raising was superintended by Mr. Joseph Hill. The plan adopted was this: three gin-poles, as they are called, were erected in the form of a triangle: each of them was well braced, and tackles were rove at their tops: the tackles were hooked to strong straps about fifty feet up the spire, with nine men to each tackle, and four men to steady the end with following poles. It was raised in about four hours from the commencement of the straining of the tackles, and had a very beautiful appearance while rising. The whole operation, we have been told, was conducted as nearly as possible in silence, the architect himself regulating by signs the action of the groups at the gin-poles, being himself governed by the plumb-line suspended in a high frame before him.

"No workman steel, no ponderous axes rung;
Like some tall palm, the noiseless fabric sprung."

Perhaps Fontana's exploit of setting on end the obelisk in front of St. Peter's, in Rome, suggested the possibility of causing a tower and spire complete to be suddenly seen rising above the roof of the Yorkville St. Paul's. On an humble scale we have Fontana's arrangements reproduced. While in the men at the gin-poles worked in obedience to signs, we have the old Egyptians over again—a very small detachment of them indeed,—as seen in the old sculptures on the banks of the Nile.

The original St. Paul's, before it acquired in this singular manner the dignified appurtenance of a steeple, was a long, low, barn-like, wooden building. Mr. Howard otherwise improved it, enlarging it by the addition of an aisle on the west side. When some twenty years later, viz., in 1861, the new stone church was erected, the old wooden structure was removed bodily to the west side of Yonge Street, together with the tower, curtailed, however, of its spire. We have been informed that the four fine stems, each eighty-five feet long, which formed the interior frame of the tower and spire of 1841, were a present from Mr. Allan, of Moss Park; and that the Rev. Charles Mathews, occasionally officiating in St. Paul's, gave one hundred pounds in cash towards the expense of the ornamental addition now made to the edifice. The history of another of Mr. Howard's erections on Yonge Street, which we are perambulating, illustrates the rapid advance and expansion of architectural ideas amongst us. In the case now referred to it was no shell of timber and deal-boards that was taken down, but a very handsome solid edifice of cut-stone, which might have endured for centuries. The Bank of British North America, built by Mr. Howard, at the corner of Yonge Street and Wellington Street in 1843, was deliberately taken down, block by block, in 1871, and made to give place to a structure which should be on a par in magnificence and altitude with the buildings put up by the other Banks. Mr. Howard's building, at the time of its erection, was justly regarded as a credit to the town. Its design was preferred by the directors in London to those sent in by several architects there. Over the principal entrance were the Royal Arms, exceedingly well carved in stone on a grand scale, and wholly disengaged from the wall; and conspicuous over the parapet above was the great scallop-shell, emblem of the gold-digger's occupation, introduced by Sir John Soane, in the architecture of the Bank of England.

The Cemetery, the gates and keeper's lodge of which, after crossing the concession road and advancing on our way northward, we used to see on the left, was popularly known as "The Potter's Field"—"a place to bury strangers in." Its official style was "The York General or Strangers' Burying Ground." In practice it was the Bunhill Fields of York—the receptacle of the remains of those whose friends declined the use of the St. James's churchyard and other early burial-plots. Walton's Directory for 1833, gives the following information, which we transfer hither, as well for the slight degree of quaintness which the narrative has acquired, as also on account of the familiar names which it contains. "This institution," Walton says, "owes its origin to Mr. Carfrae, junior. It comprises six acres of ground, and has a neat sexton's house built close by the gate. The name of the sexton is John Wolstencroft, who keeps a registry of every person buried therein. Persons of all creeds and persons of no creed, are allowed burial in this cemetery: fees to the sexton, 5s. It was instituted in the fall of 1825, and incorporated by Act of Parliament, 30th January, 1826. It is managed by five trustees, who are chosen for life; and in case of the death of any of them, a public meeting of the inhabitants

is called, when they elect a successor or successors in their place. The present trustees (1833) are Thomas Carfrae, jun., Thomas D. Morrison, Peter Paterson, John Ewart, Thomas Helliwell.' Mr. Carfrae was for some years the Collector of Customs of the Port of York. The others were respectively the medical man, iron-merchant, builder, and brewer, so well known in the neighborhood.—A remote requestered piece of ground in 1825, the Potter's Field in 1845 was more or less surrounded by buildings, and regarded as an impediment in the way of public improvement. Interments were accordingly prohibited. To some extent it has been cleared of human remains, and in due time will be built over. Its successor and representative is the Toronto Necropolis, the trustees of which are empowered, after the lapse of twenty-one years, to sell the old burying-ground.

Proceeding on, we were immediately opposite the Red Lion Tavern, anciently Tiers', subsequently Price's, on the east side; a large and very notable halting-place for loaded teams after the tremendous struggle involved in the traverse of the Blue Hill ravine, of which presently. In old European lands, in times by-gone, the cell of a hermit, a monastery, a castle, became often the nucleus of a village or town. With us on the American continent, a convenient watering or baiting place in the forest for the wearied horses of a farmer's waggon or a stage-coach is the less romantic *punctum saliens* for a similar issue. Thus Tiers's, at which we have paused, may be regarded as the germ of the flourishing incorporation of Yorkville. Many a now solitary way-station on our railroads will probably in like manner hereafter prove a centre round which will be seen a cluster of human habitations. We discover from a contemporary *Gazette* that so early as 1808, previous, perhaps, to the establishment of the Red Lion on Yonge Street, Mr. Tiers had conducted a public house in the town of York. In the *Gazette* of June 13, 1808, we have the following announcement. It has an English ring: "Beefsteak and Beer House.—The subscriber informs his friends and the public that he has opened a house of entertainment next door to Mr. Hunt's, where his friends will be served with victualing in good order, on the shortest notice, and at a cheap rate. He will furnish the best strong beer at 8d. New York currency per quart, if drank in his house, and 2s. 6d. New York currency per gallon if taken out. As he intends to keep a constant supply of racked beer, with a view not to injure the health of his customers, and for which he will have to pay cash, the very small profits at which he offers to sell, will put it out of his power to give credit, and he hopes none will be asked. N.B. He will immediately have entertainment for man and horse. Daniel Tiers. York, 12th January, 1808."

The singular *Hotel de Ville* which in modern times distinguishes Yorkville has a Flemish look. It might have strayed hither from Ghent. Nevertheless, as seen from numerous points of view, it cannot be characterized as picturesque, or in harmony with its surroundings. The shield of arms sculptured in stone and set in the wall above the circular window in the front gable, presents the following charges arranged quarterly: a Beer-barrel, with an S below; a Brick-mould, with an A below; an Anvil, with a W below; and a Jackplane, with a D below. In the centre, in a shield of pretence, is a Sheep's head, with an H below. These symbols commemorate the first five Councillors or Aldermen of Yorkville at the time of its incorporation in 1853, and their trades or callings; the initials being those respectively of the surnames of Mr. John Severn, Mr. Thomas Atkinson, Mr. James Wallis, Mr. James Dobson, and Mr. Peter Hutty. Over the whole, as a crest, is the Canadian Beaver.

The road which enters from the west, a little way on, calls up memories of Russell-hill, Davenport and Spadina, each of them locally historic. We have already spoken of them in our journey along Front Street and Queen Street, when, in crossing Brock Street, Spadina-house in the distance caught the eye. It is a peculiarity of this old bye-road that, instead of going straight, as most of our highways monotonously do, it meanders a little, unfolding a number of pretty suburban scenes. The public school, on the land given to Yorkville by Mr. Ketchum, is visible up this road. In this direction were the earliest public ice-houses established in our region, in rude buildings of slab, thickly thatched over with pine branches. Spring-water ice, gathered from the neighbouring mill-ponds, began to be stored here in quantities by an enterprising man of African descent, Mr. Richards, five-and-thirty years ago.

On the east side of Yonge Street, near the northern toll-gate, stood Dr. R. C. Horne's house, the lurid flames arising from which somewhat alarmed the town in 1837, when the malcontents of the north were reported to be approaching with hostile intent. Of Dr. Horne we have already poken, in connexion with the early press of York.

Were the tall and very beautiful spire which in the present day is to be seen where the Davenport Road enters Yonge Street, the appendage of an ecclesiastical edifice of the mediæval period—as the architecture implies—it would indicate, in all probability, the presence of a Church of St. Giles. St. Ægidius or Giles presided, it was imagined, over the entrances to cities and towns. Consequently, fancy will always have it, whenever we pass the very interesling pile standing so conspicuously by a public gate, or where for a long while there was a public gate, leading into the town, that here we behold the St. Giles' of Toronto.

Of long standing is the group of buildings on the right after passing the northern gate, or the site of the northern gate. It is the Brewery and malting-house of Mr. Severn, settled here since 1835. The main building overlooks a ravine which, as seen by the passer-by on Yonge Street, retains to this day in its eastern recess a great deal of natural beauty, although the stream below attracted manufacturers at an early period to its borders at numerous points. There is a picturesque irregularity about the outlines of Mr. Severn's brewery. The projecting galleries round the domestic portion of the building pleasantly indicate that the adjacent scenery is not unappreciated; nay, possibly enjoyed on many a tranquil autumn evening.

Further on, a block-house of two storeys, both of them rectangular, but the upper turned half round on the lower, built in consequence of the troubles of 1837, and supposed to command the great highway from the north, overhung a high bank on the right. (Another of the like build was placed at the eastern extremity of the First Concession Road. It was curious to observe how rapidly these two relics acquired the character and even the look, gray and dilapidated, of age. With many, they dated at least from the war of 1812.)

A considerable stretch of striking landscape here skirts our route on the right. Rosedale-house, the old extra-mural home, still existent and conspicuous, of Mr. Stephen Jarvis, Registrar of the Province in the olden time, afterwards of his son the Sheriff, of both of whom we have had occasion to speak repeatedly, was always noticeable for the romantic character of its situation; on the crest of a precipitous bank overlooking deep winding ravines. Set down here while yet the forest was but little encroached on, access to it was of course for a long time, difficult and laborious.—The memorable fancy ball given here at a comparatively late period, but during the Sheriff's lifetime, recurs as we go by. On that occasion, in the dusk of evening, and again probably in the gray dawn of morning, an irregular procession thronged the highway of Yonge Street and toiled up and down the steep approaches of Rosedale-house—a procession consisting of the simulated shapes and forms that usually revisit the glimpses of the moon at masquerades,—knights, crusaders, Plantagenet, Tudor and Stuart princes, queens and heroines; all mixed up with an incongruous ancient and modern canaille, a Tom of Bedlam, a Bottom "with amiable cheeks and fair large ears," an Ariel, a Paul Pry, a Pickwick, &c., &c., not pacing on with some veri-similitude on foot or respectably mounted on horse, ass, or mule, but borne along most prosaically on wheels or in sleighs. This pageant, though only a momentary social relaxation, a transient but still not unutilitarian freak of fashion, accomplished well and cleverly in the midst of a scene literally a savage wild only a few years previously, may be noted as one of the many outcomes of precocity characterizing society in the colonies of England. In a burlesque drama to be seen in the columns of a contemporary paper (the *Colonist*, of 1839) we have an allusion to this memorable entertainment. The news is supposed to have just arrived of the union of the Canadas, to the dismay, as it is pretended, of the official party, among whom there will henceforth be no more cakes and ale. A messenger, Thomas, speaks:

> List, oh, list—the Queen hath sent
> A message to her Lords and trusty Commons—
> ALL.—What message sent she?
> THOMAS.—Oh the dreadful news!
> That both the Canadas in one be joined.—(*faints.*)

Sheriff William then speaks:

> Farewell ye masquerades, ye sparkling routs:
> Now routed out, no more shall routs be ours;
> No gilded chariots now shall roll along;
> No sleighs that sweep across our icy path,—
> Sleighs! no: this news that slays our warmest hopes,
> Ends pageantry, and pride and masquerades.

The characters in the dramatic *jeu d' esprit*, from which these lines are taken, are the principal personages of the defeated party, under thinly disguised names, Mr. Justice Clearhead, Mr. John Scott, William Welland, Judge Brock, Christopher, Samuel, Sheriff William, as above, and Thomas, &c.—Rosedale is a name of pleasant sound. We are reminded thereby of another of the same genus, but of more recent application in these parts—Hazeldean—the pretty title given by Chief Justice Draper to his rural cottage, which overhangs and looks down upon the same ravine as Rosedale, but on the opposite side.

The perils and horrors encountered every spring and autumn by travellers and others in their ascent and descent of the precipitous sides of the Rosedale ravine, at the point where the primitive Yonge Street crossed it, were a local proverb and by-word: perils and horrors ranking for enormity with those associated with the passage of the Rouge, the Credit, the Sixteen, and a long list of other deeply ploughed watercourses intersected of necessity by the two great highways of Upper Canada. The ascent and descent of the gorge here were spoken of collectively as the "Blue Hill." Certain strata of a bluish clay had been remarked at the summit on both sides. The waggon-track passed down and up by two long wearisome and difficult slopes cut in the soil of the steep sides of the lofty banks. After the autumnal rains and during the thaws at the close of winter, the condition of the route here was indescribably bad. At the period referred to, however, the same thing, for many a year, was to be said of every rood of Yonge Street throughout its thirty miles of length. Nor was Yonge Street singular in this respect. All our roads were equally bad at certain seasons every year. We fear we conveyed an impression unfavorable to emigration many years ago, when walking with two or three young English friends across some flat clayey fields between Cambridge and the Gogmagogs. It chanced that the driftways for the farmers' carts—the holls as they are locally called, if we remember rightly—at the sides of the ploughed land were mire from end to end. Under the impulse of the moment, pleased in fact with a reminder of home far-distant, we exclaimed, "Here are Canadian roads!" The comparison was altogether too graphic; and our companions could never afterwards be got to entertain satisfactory notions of Canadian civilization. But English roads were not much better a century ago. We made a note once of John Moody's account of Lady Townley's journey with her coach and four and large household to London, from the veritable old-country York, in Sir John Vanbrugh's comedy of the Provoked Husband, so perfect a parallel did it furnish to the traveller's experience here on Yonge Street on his way from the Canadian York to the Landing in stage-coach or farmer's waggon in the olden time. "Some impish trick or other," said John Moody, "plagued us all the day long. Crack goes one thing: bounce goes another: Woa, says Roger—then sowse! we are all set fast in a slough. Whaw, cries Miss: scream go the maids: and bawl just as thof they were stuck: and so, mercy on us! this was the trade from morning to night." The mode of extricating a vehicle from a slough or mudhole when once in, may be gathered from a passage in McTaggart's "Three Years in Canada," ii., 205. The time referred to is 1829: "There are few roads," McTaggart says, "and these are generally excessively bad, and full of mudholes in which if a carriage fall, there is great trouble to get it out again. The mail-coaches or waggons are often in this predicament, when the passengers instantly jump off, and having stripped rails off the fence, they lift it up by sheer force. Coming up brows they sometimes get in; the horses are then taken out, and yoked to the stern instead of the front; and it is drawn out backwards."

The country between York and Lake Huron was, as we have already seen, first explored by Governor Simcoe in person, in 1793. It was also immediately surveyed, and in some measure occupied; and so early as 1794, we read in a *Gazette* the following notice: "Surveyor-General's Office, Upper Canada, 15th July, 1794. Notice is hereby given that all persons, who have obtained assignments for land on Dundas Street, leading from the head of Burlington Bay to the upper forks of the River Thames, and on Yonge Street leading from York to Lake Simcoe, that unless a dwelling-house shall be built on every lot under certificate of location, and the same occupied within one year from the date of their respective assignments, such lots will be forfeited on the said Roads. D. W. Smith, Acting Surveyor General." All the conditions required to be fulfilled by the first settlers were these: "They must within the term of two years, clear fit for cultivation and fence, ten acres of the lot obtained; build a house 16 by 20 feet of logs or frame, with a shingle roof; also cut down all the timber in front of and the whole width of, the lot (which is 20 chains, 133 feet wide), 33 feet of which must be cleared

smooth and left for half of the public road." To issue injunctions for the performance of such work was easy. To do such work, or to get such work effectually done, was, under the circumstances of the times, difficult. Hence Yonge Street continued for some years after 1794 to be little more than a rambling forest wheel track through the woods.

In 1794, as we have before heard, Mr. William Berczy, brought over from the Pulteney Settlement, on the south side of Lake Ontario, sixty German families, and conducted them to the township of Markham, north-east of York, where lands had been assigned them. In effecting this first lodgement of a considerable body of colonists in a region entirely new, Mr. Berczy necessarily cut out by the aid of his party, and such other help as he could obtain, some kind of track through the forest, along the line of Yonge Street. He had already once before successfully accomplished a similar work. He had, we are told, hewn out a waggon road for emigrants through trackless woods all the way from Philadelphia to the Genesee country, where the Pulteney Settlement was.

In 1795, Mr. Augustus Jones, a Deputy Provincial Surveyor, who figures largely in the earliest annals of Upper Canada, was directed by the Lieutenant Governor to survey and open in a more effective manner the route which Mr. Berczy and his emigrants had travelled. A detachment of the Queen's Rangers was at the same time ordered to assist. On the 24th December, 1795, Mr. Jones, writes to D. W. Smith, Acting Surveyor General:—"His Excellency was pleased to direct me, previous to my surveying the township of York, to proceed on Yonge Street, to survey and open a cart-road from the harbour at York to Lake Simcoe, which I am now busy at; (*i. e.*, I am busily engaged in the preparations for this work.) Mr. Pearse is to be with me in a few days' time with a detachment of about thirty of the Queen's Rangers, who are to assist in opening the said road." Then in his Note-book and Journal for the new year 1796, he records the commencement of the survey, thus:—"Monday, 4th (January, 1796). Survey of Yonge Street. Begun at a Post near the Lake, York Harbour, on Bank, between No. 20 and 21, the course being, Mile No. 1, N. Sixteen degrees W., eighty chains, from Black Oak Tree to Maple Tree on the right side, along the said Yonge Street: at eighteen chains, fifty links, small creek; at twenty-eight chains, small creek; course the same at thirty-two eighty: here First Concession. At thirty-eight, N. 35 W. to 40-50: at 39-50, swamp and creek, 10 links across, runs to the right: then N. 2 E., to 43 chains in the line. At 60-25, small creek runs to right; swampy to 73; N. 29 W. to 77, swamp on right. Then N. to 80 on line. Timber chiefly white and black oak to 60, and in many places windfalls thereon: maple, elm, beech, and a few oaks, black ash; loose soil. Mile No. 2, do. 80 chains; rising Pine Ridge to 9 on top," &c., and so on day by day, until Tuesday, Feb. 16th, when the party reaches the Landing. For Mile No. 33 we have the entry. "Course do. (N. 9 W.) 80 chains; descended; at 10 chains, small creek; cross aforesaid small creek; at 30, several cedars to 35-50; at 33 creek about 30 links across, runs to left; at 80 chains, hemlock tree on the right bank, small creek; timber, hemlock, pine, a few oak; broken soil. At Mile 34, do., 53 chains to Pine tree marked at Landing; timber, yellow and white Pines; sandy soil; slight winds from the north; cloudy, cold weather." The survey and opening of the Street from York bay to the Landing thus occupied forty-three days (January 4, to February 16). Three days sufficed for the return of the party to the place of beginning. The memoranda of these three days, and the following one, when Mr. Jones presented himself before the Governor, in the Garrison at York, run thus: "Wednesday, 17th, returned back to a small Lake at the twenty-first mile tree; pleasant weather, light winds from the west. Thursday, 18th, came down to five mile tree from York; pleasant weather. Friday, 19th, came to the town of York; busy entering some of my field notes; weather as before. Saturday, 20th, went to Garrison, York, and waited on His Excellency the Governor, and informed him that Yonge Street is opened from York to the Pine Fort Landing, Lake Simcoe. As there is no provision to be had at the place," Mr. Jones proceeds, "His Excellency was pleased to say that I must return to Newark, and report to the Surveyor General, and return with him in April next, when the Executive will sit, and that my attendance would be wanted. Pleasant weather, light winds from the west." The entry on the following Monday is this: "The hands busy at repairing (caulking) the boat to return to Burlington Bay, and thence to Newark; light winds from south, a few clouds. Tuesday, 23rd, high winds from the south-west hinder going on the Lake. Wednesday, 24th, high winds from the south drove a great quantity of ice into the harbour; obliged me to leave the boat, and set out by land; went to the Etobicoke. Thursday, 25th, came along the Lake to the 16 mile creek; winds left from south, thaw-

Friday, 26th, came down to my house, Long Beach; calm, thaw," &c. Then on Tuesday, the 1st of March, 1876, the entry is: "Came down to 12-mile creek; lame in my feet; high winds from N. W., frosty night. Wednesday, 2nd, came down to Newark; some snow, calm, frosty weather. Thursday, 3rd, busy entering some field notes; some snow, calm weather. Friday, 4th, busy protracting Yonge Street; cold weather, high winds from N.W." Finally on Monday, 7th March (1796), we have the entry: "Busy copying of Yonge Street; high winds from the north, cold, snow fell last night about six inches."

Some romance attaches to the history of Mr. Augustus Jones. We have his marriage mentioned in a *Gazette* of 1798, in the following terms: "May 21. Married, at the Grand River, about three weeks since, A. Jones, Esq., Deputy Surveyor, to a young lady of that place, daughter of the noted Mohawk warrior, Terrihogah." The famous Indian Wesleyan missionary, Peter Jones' called in the Indian tongue Kah-ke-wa-quo-na-by, Sacred Waving Feathers, was of the issue of this marriage. Peter Jones, in his published Autobiography, thus speaks: "I was born at the Heights of Burlington Bay, Canada West, on the first day of January, 1802. My father, Augustus Jones," he continues, "was of Welsh extraction. His grandfather emigrated to America previous to the American Revolution, and settled on the Hudson River, State of New York. My father, having finished his studies as a land surveyor in the city of New York, came with a recommendation from Mr. Colden, son of the Governor of that State, to General Simcoe, Governor of Upper Canada, and was immediately employed by him as the King's Deputy Provincial Surveyor, in laying out town-plots, townships and roads in different parts of the Province. This necessarily brought him in contact with the Indian tribes, and he learned their language, and employed many of them in his service. He became much interested in the Indian character—so much so that he resolved to take a wife from amongst them. Accordingly, he married my mother, Tuh-ben-ah-nee-quay, daughter of Wahbanosay, a chief of the Missisauga tribe of the Ojibway nation. I had one brother, older than myself, whose name was Tyenteneged (given to him by the famous Captain Joseph Brant), but better known by the name of John Jones. I had also three younger brothers and five sisters. My father being fully engaged in his work, my elder brother and myself were left entirely to the care and management of our mother, who, preferring the customs and habits of her nation, taught us the superstitions of her fathers—how to gain the approbation of the Munedoos (or gods), and how to become successful hunters. I used to blacken my face with charcoal, and fast, in order to obtain the aid of personal gods or familiar spirits, and likewise attended their pagan feasts and dances. For more than fourteen years I lived and wandered about with the Indians in the woods, during which time I witnessed the woful effects of the firewater which had been introduced amongst us by the white people." There is a discrepancy, it will be observed, between the *Gazette* and the Autobiography, in regard to the name and tribe of the father of Mr. Jones' Indian bride. The error, no doubt, is on the side of the *Gazette*. It is pleasant to find, in 1826, the now aged surveyor writing in the following strain to his missionary son, in a letter accompanying the gift of a horse, dated Coldsprings, Grand River: "Please to give our true love to John and Christina," he says, "and all the rest of our friends at the Credit. We expect to meet you and them at the camp meeting. I think a good many of our Indians will come down at that time. I send you Jack, and hope the Lord will preserve both you and your beast. He is quiet and hardy: the only fault I know he stumbles sometimes; and if you find he does not suit you as a riding horse, you can change him for some other; but always tell your reasons. May the Lord bless you! Pray for your unworthy father, Augustus Jones."

Augustus Jones was, as has been already seen, concerned in the very earliest survey of York and the township attached. As we have at hand the instructions issued for this survey, we give them. It will be noticed that the Humber is therein spoken of as the Toronto River, and that the early settler or trader St. John is named, from whom the Humber was sometimes called St. John's River. The document likewise throws light on the mode of laying out townships by concessions. On general grounds, therefore, it will not be inappropriate in an account of the early settlement of Yonge Street:

"Surveyor-General's Office, Province of Upper Canada, 26th January, 1793.—Description of the Township of York (formerly Toronto), to be surveyed by Messrs. Aitken and Jones.—The front line of the front concession commences adjoining the township of Scarborough, (on No. 10), at a point known and marked by Mr. Jones, running S. 74° W. from said front one chain, for a road; then five lots of twenty chains each, and one chain for a road; then five lots more of

twenty chains each, and one chain for a road; and so on, till the said line strikes the River Toronto, whereon St. John is settled. The concessions are one hundred chains deep, and one chain between each concession, to the extent of twelve miles."

We subjoin a further early notice of Mr. Augustus Jones, which we observe in a letter addressed to him by John Collins, Deputy Surveyor-General, dated "Quebec, Surveyor-General's Office, January 23rd, 1792." Mr. Collins mentions that he has recommended Mr. Jones to the notice of Governor Simcoe, who was at the time in Quebec, *en route* for his new Province in the west. "Colonel Simcoe, the Governor of your Province," Mr. Collins says, "is now with us. I have taken the liberty to recommend you to him in the manner I think you merit, and I cannot doubt but that you will be continued in your salary."

Another early surveyor of note, connected with the primitive history of Yonge Street, was John Stegmann, a German, who had been an officer in a Hessian regiment. He was directed in 1801, by the Surveyor General, D. W. Smith, to examine and report upon the condition of Yonge Street. The result was a document occupying many sheets. We will give some extracts from it. They will furnish a view of the great thoroughfare which we are beginning to perambulate, as it appeared a few years after Jones's expedition. Though somewhat dryly imparted, the information will be of interest to "pioneers." (The No. 1 referred to is the first lot after crossing the Third Concession Road from the Lake Shore.) "Agreeable to your instructions," Mr. Stegmann says to Mr. Smith, "bearing date June the 10th, [1801], for the examination of Yonge Street, I have the honor to report thereon as follows: That from the town of York to the three mile post on the Poplar Plains the road is cut, and that as yet the greater part of the said distance is not passable for any carriage whatever, on account of logs which lie in the street. From thence to Lot No. 1 on Yonge Street the road is very difficult to pass, at any time, agreeable to the present situation in which the said part of the street is. The situation of the street from No. 1 to Lot 95 on Yonge Street will appear as per margin." We have then a detail of his notes of the condition of the road opposite every lot all the way to the northern limit of the townships of King and Whitchurch. Of No. 1 in the township of York, on the west side of Yonge Street, it is reported that the "requisition of Government" is "complied with, except a few logs in the street not burnt." Of lot 1 on the east side also, that it is complied with, except a "few logs not burnt." No. 2, west side, complied with; the street cut but not burnt. East side, complied with; some logs in the street not burnt; and in some places narrow. No. 3, west side, complied with, except a few logs not burnt; east side, complied with; the clearing not fenced; no house; some logs in the street not burnt. No. 5, west side, complied with; east side, non-compliance. No. 8, west side, complied with; the street cut, but not burnt. East side, complied with; the street cut, but logs not burnt; here the street, it is noted, goes to the eastward of the line on account of the hilly ground. No. 9, west side, complied with in the clearing; the street bad and narrow. East side, non-compliance; street bad and narrow, and to the east of the road. No. 16, west side, nothing done to the road; about five acres cut; not fenced and no house thereon. East side, complied with. No. 17, west side, complied with; the underbrush in the street cut but not burnt. East side, complied with, except logs in the street not burnt. No. 18, west side, well complied with. East side, well complied with. No. 25, west side, complied with. East side, complied with; nothing done to the street, and a school-house erected in the centre of the street. This is the end of the township of York Then on No. 33, west side, Vaughan, clearing is complied with; no house; and nothing done to the street. East side, Markham, clearing is complied with; south part of the street cut but not burnt; and north part of the street nothing done. No. 37, Vaughan, clearing complied with, but some large trees and some logs left in the street. Markham, some trees and logs left in the streets; some acres cut, but not burnt; no fence, and a small log house. No. 55, Vaughan, clearing complied with; the street cut and logs not burnt. Markham, clearing complied with; the street cut and logs not burnt; a very bad place for the road and may be laid out better. No. 63, west side, King, non-compliance. East side, Whit church, non-compliance; and similarly, on to No. 88, on which, in King, the clearing is complied with; not fenced; the street good; in Whitchurch, clearing is complied with, and nothing done to the street. No. 93, King, four acres cut, and nothing done to the street. Whitchurch, six acres clear land, and nothing done to the street. Here King and Whitchurch, and the Report end. Mr. Stegmann then perorates thus: "Sir,—This was the real situation of Yonge Street when examined by me; and I am sorry to be under the necessity to add at the

conclusion of this report, that the most ancient inhabitants of Yonge Street have been the most neglectful in clearing the street; and I have reason to believe that some trifle with the requisition of government in respect of clearing the street." Mr. Berczy brought over his sixty-four families in 1794. The most ancient inhabitants were thus of about seven years' standing. If we men of the second generation regarded Yonge Street as a route difficult to travel, what must the first immigrants from the Genesee country and Pennsylvania have found it to be? They brought with them vehicles and horses and families and some household stuff. "The body of their waggons," we are told in an account of such new-comers in the *Gazetteer* of 1799, "is made of close boards, and the most clever have the ingenuity to caulk the seams, and so by shifting off the body from the carriage, it serves to transport the wheels and the family." Old settlers round New Market used to narrate how in their first journey from York to the Landing they lowered their waggons down the steeps by ropes passed round the stems of saplings, and then hauled them up the ascent on the opposite side in a similar way.

We meet with Mr. Stegmann, the author of the above-quoted report in numerous documents relating to surveys and other professional business done for the Surveyor General. His clear, bold handwriting is always recognizable. His mode of expressing himself is vigorous and to the point, but slightly affected by his imperfect mastery of the English language. He gives the following account of himself in his first application to the Surveyor General, asking for employment. "My name is John Stegmann," he says, "late lieutenant in the Hessian Regiment of Lossberg, commanded by Major General de Loos, and served during the whole war in America till the reduction took place in the month of August, 1783, and by the favour and indulgence of His Excellency, Lord Dorchester, I obtained land in this new settlement and township of Osnabruck, and an appointment as Surveyor in the Province; he has a wife and small family to provide for." Descendants of his are still to be found in the neighbourhood of Pine Grove in Vaughan. Their name is now Anglicised by the omission of one of the final *n*'s.

The names of other early surveyors may be learned from the following notice, taken from a *Gazette*: "Surveyor General's Office, York, 25th April, 1805. That it may be known who are authorized to survey lands on the part of the Crown, within this Province, the following list is communicated to the public of such persons as are duly licensed for that purpose, to be surveyors therein, viz., William Chewett, York; Thomas Smith, Sandwich; Abraham Iredell, Thomas Welch, Augustus Jones, William Fortune, Lewis Grant, Richard Cockrell, Henry Smith, John Rider, Aaron Greeley, Thomas Fraser, Reuben Sherwood, Joseph Fortune, Solomon Stevens, Samuel S. Wilmot, Samuel Ryckman, Mahlon Burwell, Adrian Marlet, Samuel Ridout, George Lawe. (Signed,) C. B. Wyatt, Surveyor General."

Of Mr. Berczy, above spoken of, we shall soon have to give further particulars. We must now push on.

Just beyond the Blue Hill ravine, on the west side stood for a long while a lonely unfinished frame building, with gable toward the street, and windows boarded up. The inquiring stage-passenger would be told, good-humouredly, by the driver, that it was Rowland Burr's Folly. It was, we believe, to have been a Carding or Fulling Mill, worked by peculiar machinery driven by the stream in the valley below; but either the impracticability of this from the position of the building, or the as yet insignificant quantity of wool produced in the country made the enterprise abortive. Mr. Burr was an emigrant to these parts from Pennsylvania in 1803, and from early manhood was strongly marked by many of the traits which are held to be characteristic of the speculative and energetic American. Unfortunately in some respects for himself, he was in advance of his neighbours in a clear perception of the capabilities of things as seen in the rough, and in a strong desire to initiate works of public utility, broaching schemes occasionally, beyond the natural powers of a community in its veriest infancy. A canal to connect Lake Ontario with the Georgian Bay of Lake Huron, *via* Lake Simcoe and the valley of the Humber was pressed by him as an immediate necessity, years ago; and at his own expense he minutely examined the route and published thereon a report which has furnished to later theorizers on the same subject much valuable information. Mr. Burr was a born engineer and mechanician and at a more auspicious time, with proper opportunities for training and culture, he would probably have become famed as a local George Stephenson. He built on his own account, or for others, a number of mills and factories, providing and getting into working order the complicated mechanism required for each; and this at a time when such undertakings were not

easy to accomplish, from the unimproved condition of the country and the few facilities that existed for importing and transporting inland heavy machinery. The mills and factories at Burwick in Vaughan originated with him, and from him that place takes its name. The early tramway on Yonge Street of which we have already spoken was suggested by Mr. Burr; and when the cutting down of the Blue Hill was decided on, he undertook and effected the work.

It is now some forty years since the peculiar clay of the Blue Hill began to be turned to useful account. In or near the brick-fields, which at the present time are still to be seen on the left, Messrs. James and William Townsley burnt kilns of white brick, a manufacture afterwards carried on here by Mr. Nightingale, a family connexion of the Messrs. Townsley. Mr. Worthington also for a time engaged on the same spot in the manufacture of pressed brick and drain tiles. The Rossin House Hotel, in Toronto, and the Yorkville Town Hall were built of pressed brick made here.

Chestnut Park, which we pass on the right, the residence now of Mr. McPherson, is a comparatively modern erection, put up by Mr. Mathers, an early merchant of York, who, before building here, lived on Queen Street, near the Meadows, the residence of Mr. J. Hillyard Cameron. Oakland, Mr. John McDonald's residence, of which a short distance back we obtained a passing glimpse far to the west, and Rathnally, Mr. McMaster's palatial abode, beyond, are both modern structures, put up by their respective occupants. Woodlawn, still on the left, the present residence of Mr. Justice Morrison, was previously the home of Mr. Chancellor Blake, and was built by him.

Summer Hill, seen on the high land far to the right, and commanding a noble view of the wide plain below, including Toronto with its spires and the lake view along the horizon, was originally built by Mr. Charles Thompson, whose name is associated with the former travel and postal service of the whole length of Yonge Street and the Upper Lakes. In Mr. Thompson's time, however, Summer Hill was by no means the extensive and handsome place into which it has developed since becoming the property and the abode of Mr. Larratt Smith.

The primitive waggon track of Yonge Street ascended the hill at which we now arrive, a little to the west of the present line of road. It passed up through a narrow excavated notch. Across this depression or trench a forest tree fell without being broken, and there long remained. Teams, in their way to and from town, had to pass underneath it like captured armies of old under the yoke. To some among the country-folk it suggested the beam of the gallows-tree. Hence sprang an ill-omened name long attached to this particular spot. Near here, at the top of the hill, were formerly to be seen, as we have understood, the remains of a rude windlass or capstan, used in the hauling up of the North-West Company's boats at this point of the long portage from Lake Ontario to Lake Huron. So early as 1799 we have it announced that the North-West Company intended to make use of this route. In the Niagara *Constellation*, of August 23, 1899, we read:—"We are informed from good authority that the North-West Company have it seriously in contemplation to establish a communication with the Upper Lakes by way of York, through Yonge Street to Lake Simcoe, a distance of about 33 miles only." The *Constellation* embraces the occasion to say also, "that the government has actually begun to open that street for several miles, which example will undoubtedly be no small inducement to persons who possess property on that street and its vicinity to exert themselves in opening and completing what may be justly considered one of the primary objects of attention in a new country, a good road." The *Gazette* of March 9, in this year (1799) had contained an announcement that "the North-West Company has given twelve thousand pounds towards making Yonge Street a good road, and that the North-West commerce will be communicated through this place (York): an event which must inevitably benefit this country materially, as it will not only tend to augment the population, but will also enhance the present value of landed property."

Bouchette, writing in 1815, speaks of improvements on Yonge Street, "of late effected by the North-West Company." "This route," he says in his Topographical Description, "being of much more importance, has of late been greatly improved by the North-West Company for the double purpose of shortening the distance to the Upper Lakes, and avoiding any contact with the American frontiers."

As stated already in another connection, we have conversed with those who had seen the cavalcade of the North-West Company's boats, mounted on wheels, on their way up Yonge Street. It used to be supposed by some that the tree across the notch through which the road

passed had been purposely felled in that position as a part of the apparatus for helping the boats up the hill.

The table-land now attained was long known as the Poplar Plains. Stegmann uses the expression in his Report. A pretty rural by-road that ascends this same rise near Rathnally, Mr. McMaster's house, is still known as the Poplar Plains road. A house, rather noticeable, to the left, but lying slightly back and somewhat obscured by fine ornamental trees that overshadow it, was the home for many years of Mr. J. S. Howard, sometime Postmaster of York, and afterwards Treasurer of the counties of York and Peel: an estimable man, and an active promoter of all local works of beneficence. He died in Toronto in 1866, aged 68. This house used to be known as Olive Grove; and was originally built by Mr. Campbell, proprietor and manager of the Ontario House Hotel, in York, once before referred to; eminent in the Masonic body, and father of Mr. Stedman Campbell, a local barrister of note, who died early. Mashquoteh to the left, situated a short distance in, on the north side of the road which enters Yonge Street here, is a colony transplanted from the neighbouring Spadina, being the home of Mr. W. Warren Baldwin, son of Dr. W. W. Baldwin, the builder of Spadina. "Mashquoteh" is the Ochipway for "meadow." We hear the same sounds in Longfellow's "Mushkoda-sa," which is, by interpretation, "prairie-fowl."

XLVIII. — YONGE STREET — FROM THE SECOND CONCESSION (DEER PARK) TO THE THIRD CONCESSION ROAD.

Deer Park, to the north of the road that enters here, but skirting Yonge Street as well, had that name given it when the property of the Heath family, allied by marriage to the Boultons of the Grange. On a part of this property was the house built by Colonel Carthew, once before referred to, and now the abode of Mr. Fisken. Colonel Carthew, a half pay officer of Cornish origin, also made large improvements on property in the vicinity of Newmarket.

While referring before to Colonel Carthew's house on this spot, in Section XIII., we erroneously said that Deer Park was now the R. C. Cemetery. That Cemetery lies to the south of the Concession Road, and was never a part of Deer Park.

Just after Deer Park, to avoid a long ravine which lay in the line of the direct route northward, the road swerved to the left and then descended, passing over an embankment, which was the dam of an adjacent sawmill, a fine view of the interior of which with the saw usually in active motion, was obtained by the traveller as he fared on. This was Michael Whitmore's sawmill. Of late years the apex of the long triangle of Noman's land that for a great while lay desolate between the original and subsequent lines of Yonge Street, has been happily utilized by the erection thereon of a Church, Christ Church, an object well seen in the ascent and descent of the street. Anciently, very near the site of Christ Church, a solitary longish wooden building, fronting southward, was conspicuous; the abode of Mr. Hudson, a provincial land surveyor of mark. Looking back southward from near the front of this house, a fine distant glimpse of the waters of Lake Ontario used to be obtained, closing the vista made in the forest by Yonge Street.

Before reaching Whitmore's sawmill, while passing along the brow of the hill overlooking the ravine which was avoided by the street as it ran in the first instance, there was to be seen at a little distance to the right, on some rough undulating ground, a house which always attracted the eye by its affectation of "Gothic" in the out-line of its windows. On the side towards the public road it showed several obtuse-headed lancet lights. This peculiarity gave the building, otherwise ordinary enough, a slightly romantic air: it had the effect, in fact, at a later period, of creating for this habitation, when standing for a considerable while tenantless, the reputation of being haunted. This house and the surrounding grounds constituted Springfield Park, the original Upper Canadian home of Mr. John Mills Jackson, an English gentleman, formerly of Downton in Wiltshire, who emigrated hither prior to 1806; but finding public affairs managed in a way which he deemed not satisfactory, he returned to England, where he published a a pamphlet addressed to the King, Lords and Commons of the United Kingdom of Great Britain and Ireland, entitled, "A View of the Political Situation of the Province," a brochure that made a stir in Upper Canada, if not in England, the local House of Assembly voting it a libel. Our Upper Canadian Parliament partially acquired the habit of decreeing reflections on the local government to be libels. Society in its infancy is apt to resent criticism, even when

legitimate. Witness the United States and Mrs. Trollope. At the same time critics of infant society should be themselves sufficiently wide-minded not to expect in infant society the perfection of society well-developed, and to word their strictures accordingly. In the preface to his pamphlet, which is a well-written production, Mr. Jackson gives the following accoun of his first connection with Canada and his early experience there: "Having by right of inheritance," he says, "a claim to a large and very valuable tract of land in the Province of Quebec, I was induced to visit Lower Canada for the purpose of investigating my title; and being desirous to view the immense lakes and falls in Upper Canada, where I had purchased som lands previous to my leaving England, I extended my travels to that country, with which I was so much pleased, that I resolved to settle on one of my estates, and expended a considerable sum on its improvement [the allusion is probably to Springfield Park]; but considering neither my person nor property secure, under the system pursued there, I have been obliged to relinquish the hope of its enjoyment." The concluding sentences of his Appeal will give an idea of the burden of his complaint. To his mind the colony was being governed exactly in the way that leads finally to revolt in colonies. The principles of the constitution guaranteed by the mother country were violated. One of his grievances was—not that a seventh of the public land had been set apart for an established Church, but—that "in seventeen years not one acre had been turned to any beneficial account; not a clergyman, except such as England pays or the Missionary Society sends (only five in number), without glebe, perquisite or parsonage house; and still fewer churches than ministers of the established religion." He concludes thus: "I call upon you to examine the Journals of the House of Assembly and Legislative Council; to look at the distribution and use made of the Crown Lands; the despatches from the Lieutenant-Governor [Gore]; the memorials from the Provincial Secretary, Receiver-General and Surveyor-General; the remonstrances of the Six Nations of Indians; and the letters from Mr. Thorpe [Judge Thorpe], myself and others, on the state of the Colony, either to the Lords of the Treasury or to the Secretary of State. Summon and examine all the evidence that can be procured here [England], and, more should appear necessary, send a commission to ascertain the real state of the Province. Then you will be confirmed in the truth of every representation I have made, and much more, which, for the safety of individuals, I am constrained to withhold. Then you will be enabled to relieve England from a great burden, render the Colony truly valuable to the mother country, and save one of the most luxuriant ramifications of the Empire. You will perform the promi of the Crown; you will establish the law and liberty directed by the [British] Parliament; and diffuse the Gospel of Christ to the utmost extremity of the West. You will do that which is honourable to the nation, beneficial to the most deserving subjects, and lovely in the sight of God." This pamphlet is of interest as an early link (its date is 1809) in the catena of protests on the subject of Canadian affairs, from Whiggish and other quarters, culminating at last in Lord Durham's Report. Nevertheless, what the old French trader said of Africa—"Toujours en maudissant ce vilain pays, on y reviens toujours"—proved true in respect to Canada in the case of Mr. Jackson, as in the case likewise of several other severe critics of Canadian public affairs in later times. He returned and dwelt in the land after all, settling with his family on Lake Simcoe, where Jackson's Point and Jackson's Landing retain his name, and where descendants of his still remain. Mr. Jackson had possessions likewise in the West Indies, and made frequent visits thither, as also to England, where at length he died in 1836. Up to about that date, we observe his name in the Commission of the Peace. In the *Loyalist* of May 24, 1828, a Biblical work by Mr. Jackson is advertised for sale at York. Thus runs the notice:—"Just received from England, and for sale at the book stores of Messrs. Meighan and Lesslie & Sons, York, a few volumes of 'The History from the Creation of the World to the death of Joshua, authenticated from the best authorities, with Notes, Critical, Philosophical, Moral and Explanatory; by John Mills Jackson, Esq., formerly Gentleman Commoner of Ball. Coll. in the University of Oxford.'" (Then follow laudatory notices of the work from private sources.)

(To be continued.)

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—JANUARY, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above aver'ge.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A. M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°													°						
1	30.003	30.115	30.193	30.1185	27.3	26.2	18.3	23.20	+ 1.87	.125	.084	.062	.090	85	58	61	70	N W b W	N W b N	N	N 44 W	18.4	17.5	7.4	11.87	12.05	...	...
2	30.151	30.005	29.839	29.9872	25.9	25.5	27.3	26.77	+ 5.49	.101	.097	.132	.120	72	71	89	83	E	E b N	E N E	N 62 E	13.4	16.4	11.0	12.87	13.45	...	...
3	29.657	29.559	.617	.6030	33.1	34.5	34.5	34.52	+13.25	.152	.192	.200	.182	81	95	100	91	E	S b E	Calm.	N 88 E	3.4	2.0	0.0	2.69	3.23	0.220	...
4	.654	.743	.797	.7380	33.1	34.2	32.4	33.10	+11.87	.175	.169	.168	.171	92	85	92	90	Calm.	N W b W	Calm.	N 46 W	0.0	2.8	0.0	0.54	0.55	nap.	...
5	.770	.607	.552	.6298	31.3	35.6	33.1	33.33	+12.12	.145	.151	.160	.152	82	71	85	81	S W b W	S W b W	W S W	S 52 W	10.6	8.5	3.6	7.03	7.21	...	...
6	.580	.742	.971	.7912	32.4	22.6	8.5	19.62	+ 1.64	.161	.063	.048	.081	88	53	76	68	W N W	N W	N	N 51 W	24.0	19.6	13.5	15.40	16.74	...	0.2
7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N b W	N	N b E	N 15 W	14.0	6.4	8.6	6.68	7.08	...	0.1
8	30.045	.910	.938	.9657	9.3	20.5	15.4	14.77	— 6.45	.056	.094	.077	.076	86	85	88	88	N N E	N E b E	N b W	N 21 E	9.6	8.6	8.0	8.44	8.78	...	...
9	29.861	.742	.779	.7870	20.1	32.4	26.2	26.17	+ 4.99	.098	.125	.132	.117	91	67	92	82	S W b W	S W b W	S W b W	S 54 W	4.8	10.8	7.6	6.62	6.68	...	...
10	.749	.696	.671	.6997	28.4	29.5	28.4	28.76	+ 7.42	.135	.144	.135	.137	86	88	86	87	W S W	S W	W	S 53 W	5.8	5.0	0.8	3.38	3.45	...	...
11	.528	.213	.232	.3163	30.6	40.3	38.1	35.90	+14.38	.145	.131	.195	.155	84	53	85	74	S S W	S S W	W S W	S 44 W	4.2	14.4	20.0	7.86	8.80	[na...	...
12	.416	.388	.304	.3693	33.8	36.3	37.0	35.70	+14.35	.158	.125	.149	.138	81	59	67	66	W b S	S W b W	S W b E	S 68 W	22.6	9.0	4.0	12.71	13.34	...	...
13	.346	.454	.746	.5412	34.9	25.9	11.8	22.57	+ 1.15	.151	.100	.058	.097	74	71	78	74	N N W	N W b N	N W b N	N 43 W	6.0	22.5	17.4	12.79	13.78	...	Inap.
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N b W	N W	N W	N 30 W	7.0	9.6	3.2	8.93	9.15	...	...
15	.773	.528	.452	.5733	6.0	22.6	23.0	17.92	— 3.58	.051	.105	.100	.084	86	86	81	82	Calm.	S E b S	S E b S	S 42 E	0.0	10.8	5.5	4.08	4.72	...	0.2
16	.496	.625	.791	.6570	15.1	20.1	17.0	17.10	— 4.48	.073	.085	.073	.077	87	78	76	81	E N E	N b W	N b W	N 29 E	10.6	8.0	5.4	6.58	7.55	...	0.4
17	.892	.886	.854	.8796	8.9	21.9	11.4	14.88	— 6.82	.049	.071	.068	.064	76	61	90	75	N N W	N W b W	Calm.	N 20 W	5.0	4.4	0.0	3.38	3.59	...	...
18	.682	.565	.625	.6205	24.1	29.1	29.1	27.53	+ 5.87	.108	.126	.134	.123	82	78	83	81	S W	S W	Calm.	S 47 W	7.0	6.0	0.0	4.61	4.64	...	Inap.
19	.609	.386	.071	.3352	28.8	32.4	32.7	31.37	+ 9.65	.143	.170	.180	.164	91	91	97	92	Calm.	E	E	East.	0.0	9.8	7.2	5.73	7.05	Inap	2.0
20	.172	.323	.435	.3195	32.0	30.6	27.0	29.56	+ 7.68	.165	.123	.122	.134	92	72	83	82	W S W	W	Calm.	S 81 W	12.5	14.0	0.0	8.36	10.25	Inap.	Inap.
21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	W	S W	S 65 W	0.0	14.2	18.4	7.52	8.02	...	0.3
22	.308	.172	.016	.1515	24.4	29.1	28.8	27.38	+ 5.49	.111	.126	.143	.126	85	78	91	85	S W b S	S W b S	S W b W	S 40 W	22.2	7.0	6.5	12.74	12.90	...	0.4
23	.260	.373	.453	.3820	5.0	12.0	11.4	8.80	—13.20	.048	.050	.057	.052	90	67	78	79	W N W	W S W	S W b W	N 69 W	15.0	9.4	1.2	7.79	8.35	...	...
24	.426	.504	.561	.5037	12.9	16.1	14.7	15.00	— 7.07	.064	.069	.067	.067	80	76	79	78	W b S	W	W S W	S 84 W	9.2	9.0	12.0	9.25	10.13	...	0.1
25	.485	.365	.345	.3918	15.1	15.4	11.4	13.97	— 8.13	.069	.071	.057	.066	79	79	78	79	S W b W	W S W	S W b W	S 61 W	14.0	23.5	15.2	17.51	17.61	...	0.1
26	.325	.249	.213	.2602	10.7	20.5	16.9	15.72	— 6.45	.052	.065	.071	.065	75	61	77	72	S W	S W b W	S W b W	S 57 W	7.0	14.4	9.0	11.61	11.85	...	...
27	.244	.261	.268	.2627	17.9	23.0	20.1	20.28	— 1.96	.077	.092	.078	.083	80	76	73	76	S W b W	W S W	Calm.	S 56 W	9.6	3.0	0.0	4.97	4.98	...	Inap.
28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	W S W	S W	S 60 W	0.0	6.6	20.0	4 19	4.31	...	...
29	.362	.465	.719	.5333	-0.8	13.2	6.4	6.57	—15.85	.039	.054	.050	.047	95	66	86	82	S W b W	W b S	S W b W	S 64 W	11.0	26.0	12.0	15.81	16.00	...	...
30	.751	.827	.855	.8178	7.5	13.2	11.1	10.60	—11.82	.053	.054	.059	.057	89	66	84	82	W b S	S W b W	S W b W	S 66 W	15.0	9.6	6.0	11.38	11.60	...	0.1
31	.783	.767	.851	.8058	11.1	16.6	13.2	13.63	— 8.74	.059	.071	.065	.066	84	77	83	82	W S W	W S W	Calm.	S 65 W	14.0	11.4	0.0	7.08	7.18	...	Inap.
	29.6047	29.5729	29.5981	29.5941	-0.70	25.16	21.70	22.39	+ 0.71	.102	.104	.105	.103	84	73	83	80	.....	.....	.....	.....	9.55	10.97	7.21	...	8.87	0.220	3.9

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JANUARY, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer..... 30.193 at 10 p.m. on 1st. } Monthly range=
Lowest Barometer..... 28.986 at 12 p.m. on 22rd. } 1.207.

Self-registering Ther.
- Maximum Temperature..... 41°8 on 11th. } Monthly range=
- Minimum Temperature .....—2°5 on 7th } 44 3.
- Mean Maximum Temperature .....27°72. } Mean daily range=
- Mean Minimum Temperature .....13°92. } 13°80.
- Greatest daily range.....39°7 from a.m. of 6th to a.m. of 7th.
- Least daily range ..... 4°0 from noon to 10 p.m. of 4th.

Warmest day.....11th...Mean Temperature.....35° 90
Coldest day .....29th...Mean Temperature.....6°57 } Difference=29°33.

Maximum Radiation. {Solar ..... 51°0 on 11th. / Terrestrial ..... — 10°0 on 15th. } Difference=61°0.

Aurora observed on 2 nights, viz.: 12th and 31st.

Possible to see Aurora on 11 nights; impossible on 21 nights.

Snowing on 15 days; depth 3.9 inches; duration of fall 57.2 hours.

Raining on 5 days; depth 0.220 inches; duration of fall 18.1 hours.

Mean of Cloudiness, 0.82.

WIND.

Resultant Direction S. 87° W.; Resultant Velocity 4.73 miles.

Mean Velocity 8.87 miles per hour.

Maximum Velocity 30.0 miles, from midnight to 1 a.m. on 12th.

Most Windy day 25th; Mean Velocity 17.61 miles per hour.

Least Windy day 3rd; Mean Velocity 0.55 miles per hour.

Most Windy hour noon; Mean Velocity 11.37 miles per hour.

Least Windy hour 8 p.m.; Mean Velocity 7.25 miles per hour.

Solar haloes on 12th, 25th and 26th.

Lunar haloes on 26th and 29th.

COMPARATIVE TABLE FOR JANUARY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1844	20.2	— 2.9	45.3	— 7.2	52.5	7	3.005	11	24.9	...	...	0.70 lbs
1845	26.5	+ 3.4	45.7	— 0.2	45.9	5	Imp.	9	22.7	...	...	0.70
1846	26.7	+ 3.6	44.0	— 1.3	45.3	5	2.335	10	6.0	...	...	0.55
1847	23.3	+ 0.2	42.4	2.7	39.7	7	2.135	5	7.5	...	...	1.09
1848	28.7	+ 5.6	51.1	—11.4	62.5	7	2.245	8	7.1	N 82 W	2.03	5.82mls
1849	18.5	— 4.6	39.5	—14.2	53.7	4	1.175	10	9.2	N 63 W	3.06	6.71
1850	29.7	+ 6.6	46.4	9.9	36.5	5	1.250	8	5.2	N 37 W	0.69	5.80
1851	25.5	+ 2.4	43.4	—12.8	56.2	4	1.275	10	7.8	S 77 W	3.26	7.69
1852	18.4	— 4.7	37.3	—10.6	47.9	0	0.000	19	30.9	N 08 W	3.14	7.67
1853	23.0	— 0.1	40.9	— 9.7	50.6	1	0.290	6	7.5	N 27 W	2.52	6.34
1854	23.6	+ 0.5	46.4	— 5.4	51.8	7	1.270	11	7.5	N 77 W	2.44	6.91
1855	25.9	+ 2.8	49.0	— 5.4	54.4	5	0.525	13	23.3	N 73 W	1.91	7.26
1856	16.0	— 7.1	34.4	—12.0	46.4	0	0.000	14	13.6	N 75 W	5.24	10.69
1857	12.8	—10.3	37.2	—20.1	57.3	3	Inap.	16	21.8	N 70 W	4.96	10.31
1858	30.0	+ 6.9	47.4	6.5	40.9	6	1.152	11	4.0	N 71 W	2.33	7.40
1859	26.4	+ 3.3	43.2	—26.5	69.7	6	1.449	19	16.4	S 81 W	3.17	8.76
1860	23.4	+ 0.3	46.4	— 6.8	53.2	6	0.740	16	8.7	N 89 W	6.09	9.37
1861	19.9	— 3.2	37.0	—11.2	48.2	4	0.685	23	20.6	N 86 W	2.92	9.30
1862	21.7	— 1.4	44.5	— 2.6	47.1	5	0.115	19	27.4	N 26 W	2.69	8.83
1863	28.1	+ 5.0	47.0	—14.0	61.0	10	1.122	17	20.6	N 61 W	1.13	7.23
1864	22.8	— 0.3	44.2	— 9.0	53.2	5	1.165	14	26.3	S 73 W	6.00	10.22
1865	17.7	— 5.4	37.2	— 9.0	46.2	1	0.440	18	14.8	N 85 W	4.80	9.39
1866	20.7	— 2.	44.0	—14.0	58.0	4	0.522	19	10.3	N 75 W	2.98	9.34
1867	17.6	— 5.5	43.8	— 4.8	48.6	1	Inap	21	42.0	N 55 W	3.27	6.96
1868	19.0	— 4.1	39.0	— 7.0	46.0	2	Inap.	21	14.6	S 83 W	3.97	8.90
1869	27.7	+ 4.6	45.0	— 1.0	46.0	4	0.887	12	9.8	N 72 W	3.40	9.21
1870	24.4	+ 1.3	45.0	— 3.2	48.2	8	3.412	18	21.3	S 89 W	2.63	8.98
1871	21.3	— 1.8	46.4	—13.2	59.6	8	0.864	23	43.6	S 49 W	2.56	9.84
1872	22.4	— 0.7	41.8	— 2.5	44.3	5	0.220	15	5.9	S 87 W	4.73	8.87
Results to 1871.	23.09	...	43.32	—7.63	50.95	4.59	1.228	13.97	17.49	N 79 W	3.12	8.29
Excess for '72	— 0.70	...	— 1.52	— 5.13	— 6.65	+ 0.41	— 1.008	+ 1.03	— 13.59	...	...	+ 0.58

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—FEBRUARY, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Relative Humidity.				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	M'E'N.		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant	MEAN		
					°	°	°	°	°																			
1	29.890	29.875	29.898	29.8838	9.3	16.1	8.9	11.55	—11.00	.051	.074	.060	.062	76	83	93	84	W S W	S W b W	Calm.	S 58 W	5.0	10.2	0.0	6.22	6.25	...	...
2	.966	30.024	.960	.9847	4.6	19.7	17.6	13.72	— 8.90	.048	.077	.075	.068	90	72	79	81	Calm.	Calm.	N E	N 33 E	0.0	0.0	4.2	2.15	3.01	...	...
3	.825	29.681	.593	.6887	19.4	22.6	18.7	19.82	— 2.85	.093	.111	.088	.094	89	92	87	88	N E	N E	N	N 36 E	12.0	12.0	10.2	9.36	9.65	...	0.3
4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S W	S W	S 72 W	6.0	14.0	22.0	8.84	10.51	...	0.1
5	.605	.799	.783	.7438	25.5	25.9	21.9	24.02	+ 1.23	.111	.113	.111	.110	81	81	94	85	W S W	S W	N E	S 49 W	18.6	1.2	9.6	6.63	9.70	...	2.7
6	.649	.713	.950	.7892	20.8	26.6	15.8	19.98	— 2.85	.104	.099	.066	.085	93	69	74	77	N N E	W S W	W N W	S 70 W	15.0	12.0	12.6	1.79	10.40	...	5.5
7	30.149	30.231	30.137	30.1732	9.3	18.3	12.5	12.17	—10.73	.051	.081	.067	.064	76	81	89	84	N E	S W	N E	N 15 W	6.6	6.6	0.3	1.63	5.27	...	...
8	29.901	29.833	29.879	29.8700	5.0	25.5	20.8	16.98	— 5.98	.048	.097	.071	.073	90	70	64	75	N E	S	N	S 76 E	2.0	5.4	4.6	2.29	4.24	...	...
9	.841	.774	.730	.7810	16.9	30.2	20.8	22.87	— 0.17	.078	.135	.096	.104	83	81	86	84	N E	E N E	N E	N 52 E	7.8	8.4	6.6	7.11	7.26	...	...
10	.705	.673	.631	.6677	20.1	30.9	21.2	23.83	+ 0.77	.092	.142	.098	.111	85	82	87	86	N E	N E	N E	N 45 E	7.8	8.4	4.8	5.96	5.98	...	...
11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	E	N	N 47 E	2.0	4.0	2.0	4.39	4.56	0.010	...
12	.670	.650	.578	.6258	32.0	37.4	34.2	34.05	+10.80	.165	.179	.169	.171	92	80	85	87	E N E	N E	E	N 71 E	4.2	5.0	13.2	5.63	6.42	inap.	..
13	.407	.098	.107	.1923	33.4	38.5	25.5	31.38	+ 8.07	.171	.207	.105	.157	90	89	76	85	E	N E	W	E	16.8	4.0	20.4	8.43	13.17	.280	0.2
14	.221	.183	.228	.2098	9.3	12.9	12.9	11.75	—11.65	.051	.064	.069	.063	76	80	89	83	W	W S W	W S W	S 73 W	16.4	14.0	18.6	14.92	15.41	...	0.4
15	.213	.273	.390	.3048	14.0	21.9	21.2	19.15	— 4.35	.067	.077	.092	.081	84	65	81	78	W	W N W	W	N 77 W	16.2	15.6	9.0	13.89	14.22	...	0.1
16	.439	.450	.491	.4678	21.5	29.5	26.6	25.82	+ 2.23	.101	.136	.127	.120	89	83	88	86	W S W	S W	N	N 72 W	3.2	7.2	11.5	3.08	5.42	...	...
17	.557	.603	.667	.6148	19.4	20.3	17.8	19.17	— 4.53	.093	.070	.084	.080	89	63	87	77	N E	N E	N E b N	N 45 E	10.0	8.7	6.4	8.74	8.84	...	inap.
18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N b E	N E b E	N b E	N 41 E	6.0	10.7	4.3	6.01	6.27	...	...
19	.737	.718	.719	.7305	16.7	30.8	20.0	22.37	— 1.53	.078	.142	.092	.103	85	82	87	84	N b E	Calm.	Calm.	N 20 E	5.5	0.0	0.0	1.77	1.93	...	...
20	.635	.395	.274	.4273	15.6	36.2	34.4	29.95	+ 5.90	.073	.168	.166	.140	82	78	83	82	Calm.	S S W	W b s	S 42 W	0.0	15.6	19.2	7.57	8.47	inap.	...
21	.388	.285	.433	.3822	23.9	30.1	11.7	20.87	— 3.35	.109	.098	.056	.085	84	58	75	74	W b s	W b s	W b N	N 47 W	9.4	30.0	18.4	17.60	18.0	...	inap.
22	.562	.576	.607	.5793	4.8	13.5	11.7	10.23	—14.08	.044	.055	.063	.054	85	68	86	78	N W	W b N	W b N	N 69 W	10.8	19.0	2.5	9.26	9.63	...	...
23	.469	.208	.135	.2602	19.2	32.2	31.5	28.85	+ 4.37	.088	.126	.141	.119	87	68	79	75	S b W	S W b S	Calm.	S 30 W	9.8	13.5	0.0	7.36	7.60	...	...
24	.125	.084	.017	.0667	35.5	43.8	38.4	39.30	+14.68	.168	.182	.215	.186	80	63	92	78	S S W	S W b S	S W b S	S 39 W	6.2	6.0	8.2	5.96	6.02	...	...
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W S W	W N W	W N W	N 76 W	12.7	30.6	15.5	16.85	18.60	.060	...
26	.955	.917	.874	.9102	7.0	17.8	14.2	13.10	—11.90	.048	.053	.053	.053	82	55	64	68	N W	W b N	W N W	N 57 W	9.8	14.2	13.0	11.39	11.69	...	...
27	.826	.730	.760	.7723	10.2	23.9	17.3	17.73	— 7.43	.052	.062	.060	.063	75	47	61	64	S W b W	W N W	N W	N 50 W	5.8	11.4	7.0	8.95	9.06	...	...
28	.797	.703	.694	.7303	13.1	25.0	14.6	17.80	— 7.60	.071	.068	.060	.065	90	51	71	69	W	N W b W	N W b N	N 44 W	8.0	13.6	11.0	10.12	10.44	...	...
29	.662	.616	.676	.6525	7.0	16.0	8.4	10.72	—14.77	.048	.044	.043	.046	82	49	70	68	N b E	N N W	N N W	N 6 W	10.0	5.4	14.8	9.76	10.73	...	...
	29.6478	29.6037	29.6084	29.6204	16.54	25.82	19.96	20.69	—2.95	.084	.106	.093	.094	85	72	81	79	.....	.....	.....	.....	.....	10.58	9.31	.....	.9[illegible]	0.350	7.3

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR FEBRUARY, 1872

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer ..... 30.231 at 2 p.m. on 7th. } Monthly range=
Lowest Barometer ..... 28.997 at 12 p.m. on 24th. } 1.234

Self-registering Ther.
- Maximum temperature ..... 45°2 on 24th. } Monthly range=
- Minimum temperature ..... — 3.6 on 2nd. } 48°8
- Mean maximum temperature ..... 29°29 } Mean daily range=
- Mean minimum temperature ..... 12°51 } 16°78
- Greatest daily range ..... 34°5 from a.m. to p.m. of 20th.
- Least daily range ..... 9°3 from a.m. to p.m. of 3rd.

Warmest day ..... 24th; mean temperature 39°30 } Difference=28°58
Coldest day ..... 29th; mean temperature 10°72 }

Maximum Solar ..... 58°0 on 12th and 14th. } Monthly range=
Radiation Terrestrial ..... —12°0 on 2nd. } 70°0

Aurora observed on 2 nights, viz.: 18th and 26th.

Possible to see aurora on 18 nights; impossible on 11 nights.

Snowing on 9 days; depth 7.3 inches; duration of fall 49.8 hours.

Raining on 5 days; depth, 0.350 inches; duration of fall, 17.8 hours.

Mean of cloudiness, 0.52.

WIND.

Resultant direction, N. 61° W.; Resultant velocity, 3.32 miles.

Mean velocity, 8.93 miles per hour.

Maximum velocity, 33.2 miles, from 2 to 3 p.m. of 25th.

Most windy day, 25th; mean velocity, 18.60 miles per hour.

Least windy day, 19th; mean velocity, 1.93 miles per hour.

Most windy hour, 2 p.m.; mean velocity, 13.57 miles per hour.

Least windy hour, 5 a.m.; mean velocity, 7.03 miles per hour.

Fog on 13th, 19th, and 20th.

Solar haloes on 1st, 5th, 6th, 10th, 20th, 24th, and 29th.

Lunar haloes on 22nd, 23rd, and 26th.

28th, Crows seen.

COMPARATIVE TABLE FOR FEBRUARY.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1844	26.0	+ 3.0	47.9	0.6	47.3	4	0.430	7	10.0	...	...	0.43 lbs
1845	26.0	+ 3.0	49.1	— 4.2	53.3	5	Imp.	9	19.0	...	...	0.99
1846	20.4	— 2.6	41.9	—16.7	58.6	0	0.000	13	46.1	..	...	0.65
1847	21.5	— 1.5	40.9	0.0	40.9	2	0.550	13	27.3	...	...	0.69
1848	26.6	+ 3.6	46.6	0.0	46.6	4	0.775	8	10.8	N 65 W	2.53	5.69 mls
1849	19.5	— 3.5	40.6	— 9.8	50.4	2	0.240	13	19.2	N 41 W	1.48	6.58
1850	26.0	+ 3.0	49.6	2.2	47.4	7	1.235	9	23.1	N 80 W	3.48	7.61
1851	27.6	+ 4.6	50.2	2.0	48.2	7	2.600	4	2.4	N 64 W	1.99	6.94
1852	23.4	+ 0.4	41.2	— 6.2	47.4	3	0.650	11	13.0	S 75 W	3.34	6.42
1853	24.1	+ 1.1	43.4	— 1.4	44.8	4	1.030	15	12.6	N 49 W	2.51	7.30
1854	21.1	— 1.9	42.8	—10.8	53.6	5	1.460	15	18.0	N 7 E	1.73	6.91
1855	15.4	— 7.6	39.0	—25.4	64.4	2	1.770	14	21.8	N 40 W	4.34	8.17
1856	15.7	— 7.3	37.8	—18.7	56.5	0	0.000	8	9.7	N 81 W	7.70	10.71
1857	28.5	+ 5.5	52.4	— 5.9	58.3	11	3.050	11	11.7	S 78 W	3.68	9.82
1858	17.0	— 6.0	42.4	— 7.3	49.7	1	inap	16	26.7	N 72 W	3.22	9.12
1859	26.0	+ 3.0	46.2	2.1	44.1	6	0.455	14	8.3	N 54 W	2.72	8.50
1860	22.8	— 0.2	50.2	— 8.5	58.7	7	1.330	13	18.8	N 61 W	3.28	8.73
1861	26.1	+ 3.1	46.0	—20.8	66.8	4	0.815	17	29.7	N 77 W	3.86	10.58
1862	22.5	— 0.5	37.8	— 5.2	43.0	3	0.180	17	23.1	N 55 W	3.93	8.52
1863	22.4	— 0.6	41.5	—19.8	61.3	7	1.450	12	22.0	N 23 W	2.27	10.13
1864	24.3	+ 1.3	45.0	—15.0	60.0	2	0.397	14	9.5	S 84 W	6.48	10.11
1865	22.4	— 0.6	42.2	—10.0	52.2	5	0.81[illegible]	11	16.8	N 23 W	3.95	8.23
1866	22.5	— 0.5	45.0	— 8.0	53.0	3	0.830	12	16.9	S 80 W	5.14	9.40
1867	28.9	+ 5.9	44.0	0.2	43.8	8	1.328	13	13.4	N 57 W	1.58	8.85
1868	17.2	— 5.8	45.0	—11.5	56.5	1	0.040	16	32.8	N 69 W	3.23	10.84
1869	25.0	+ 2.0	46.0	— 1.0	47.0	2	0.165	19	39.7	N 34 W	4.18	10.04
1870	21.5	— 1.5	40.6	— 6.6	47.2	2	0.520	18	20.1	N 29 W	2.84	8.10
1871	24.3	+ 1.3	48.0	—15.8	63.8	3	0.040	15	23.0	N 70 W	4.26	9.87
1872	20.7	— 2.3	45.2	— 3.6	48.8	5	0.350	9	7.3	N 61 W	3.32	8.93
Results to 1871	23.02	.....	44.40	—7.91	52.31	4.0	0.894	12.6	19.31	N 66 W	3.14	8.63
Excess for '72	— 2.33	.....	+ 0.80	+ 4.31	— 3.51	+ 1.0	— 0.544	— 3.6	— 12.01	...		+ 0.30

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MARCH, 1872.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	M'N		
1	29.759	29.761	29.816	29.7662	4.5	18.9	11.3	12.03	—13.53	.044	.060	.057	.055	82	58	78	79	Calm.	W N W	N b w	N 55 W	0.0	10.6	4.2	6.61	7.60	...	...
2	.695	.532	.532	.5770	7.3	20.3	16.0	14.90	—10.90	.055	.078	.074	.070	93	70	83	81	N b E	N b E	W N W	N 11 W	7.0	10.0	8.4	6.94	7.80	...	...
3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W b S	S W b S	S W	S 51 W	0.8	15.0	15.5	8.00	8.63	...	inap.
4	.225	.495	.692	.4928	17.1	5.2	—3.5	5.47	—20.78	.073	.042	.035	.047	78	75	87	79	N W b N	N W	W N W	N 57 W	26.1	25.4	13.5	17.97	19.78	...	0.4
5	.792	.708	.731	.7487	-10.6	4.4	—1.7	-1.98	—28.50	.023	039	.041	.035	87	74	94	83	N W b W	W b N	N W	N 66 W	5.2	31.2	5.5	14.53	15.08	...	...
6	.718	.690	.794	.7340	—3.1	14.2	15.4	9.47	—17.30	.030	.046	.063	.049	74	56	72	69	W N W	W N W	W b N	N 70 W	20.5	37.0	21.0	23.14	23.2	...	...
7	.859	.870	.879	.8712	12.7	24.7	15.3	17.82	— 9.18	.058	.066	.058	.062	75	48	67	64	N N W	N W b N	N N W	N 40 W	22.0	20.2	11.0	18.10	18.25	...	...
8	.897	.739	.589	.7342	10.9	22.5	23.6	19.35	— 7.95	.055	.077	.104	.079	77	63	82	74	N b E	E b N	E	N 67 E	5.0	18.0	18.2	9.39	10.85	...	...
9	.295	.201	.172	.2133	23.6	29.7	32.6	29.22	+ 1.67	.118	.162	.181	.157	94	98	98	96	E b N	E N E	E b N	N 79 E	22.4	11.5	4.2	12.24	13.65	0.170	1.1
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W b S	W b N	W b S	S 83 W	9.0	15.2	8.6	10.33	10.54	...	...
11	.569	.676	764	.6788	18.5	30.1	20.7	24.23	— 3.90	.085	.105	.079	.098	84	63	71	74	W b N	N W b N	N N W	N 21 W	0.5	5.6	10.0	4.77	5.51	...	...
12	.836	.868	.888	.8608	18.2	26.4	21.8	22.55	— 5.92	.088	.086	.106	.093	89	60	90	77	N N E	W b N	N N E	N 1 E	5.2	4.0	1.8	1.75	2.95	...	inap.
13	.816	.551	.599	.6490	20.7	28.6	30.1	28.37	— 0.40	.098	.102	.142	.121	87	65	85	78	Calm	S E b E	W S W	S 38 E	0.0	9.0	1.0	3.31	4.87	...	inap.
14	.718	.677	.642	.6828	24.3	33.3	20.3	25.80	— 3.28	.111	.119	.090	.101	85	63	83	73	W N W	S E	N W	N 42 W	2.0	7.4	20.6	7.63	9.57	...	0.1
15	.818	.890	.896	.8740	12.4	19.2	15.3	15.58	—13.83	.060	.062	.052	.059	80	60	60	68	N W b W	W b N	W b S	N 64 W	17.4	15.0	5.2	14.92	15.38	...	...
16	.817	.665	.563	.6687	10.9	28.3	25.5	22.25	— 7.50	.055	.065	.089	.073	77	41	64	61	W b N	W S W	S W b W	S 67 W	3.8	16.0	8.2	8.37	8.86	...	...
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	N W b W	N W b W	N 69 W	0.0	23.6	9.0	8.56	9.19	...	inap.
18	.519	.403	.108	.3253	11.7	28.6	29.0	23.80	— 6.63	.063	.081	.154	.102	86	51	97	75	W N W	S	E S E	S 16 W	4.0	15.0	17.6	5.38	8.79	...	2.5
19	.212	.543	.697	.5128	24.3	17.1	4.1	14.00	—16.77	.097	.049	.037	.059	74	53	72	68	W b N	W	W N W	N 75 W	25.0	30.2	6.2	20.51	20.99	...	0.3
20	.752	.778	.827	.7945	—2.0	12.4	9.1	6.60	—24.52	.036	.056	.052	.048	90	73	80	81	W b N	W	W	N 82 W	14.0	31.5	13.5	18.52	18.69	...	...
21	.824	.751	.816	.8013	8.0	18.9	9.9	12.08	—19.38	.055	.041	.054	.051	87	40	81	71	W b S	W b S	Calm.	S 86 W	9.0	25.5	0.0	11.40	11.57	...	...
22	.888	.751	.581	.7177	6.3	25.0	23.2	19.18	—12.65	.045	.075	.090	.073	78	56	72	68	W S W	S S W	Calm.	S 25 W	3.2	12.0	0.0	2.96	3.32	...	...
23	.331	.263	.481	.3615	25.7	34.0	22.5	26.32	— 5.87	.114	.156	.084	.112	82	79	70	77	S b E	W S W	W b N	S 69 W	6.4	15.0	20.6	9.66	2.03	...	2.6
24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	Calm.	N 88 W	11.6	8.0	0.0	8.51	8.86	...	...
25	.915	.713	.585	.7177	25.7	32.0	32.6	30.45	— 2.48	.121	.142	.172	.144	87	78	93	84	E b N	E N E	S E	N 83 E	13.8	13.2	2.4	9.26	9.79	...	0.5
26	.573	.744	.797	.7130	33.3	35.8	29.0	32.23	— 1.07	.181	.113	.126	.140	95	53	79	77	S W	W	Calm.	N 81 W	1.9	22.0	0.0	4.77	5.95	...	...
27	.738	.692	.768	.7363	27.2	44.9	30.4	33.50	— 0.18	.132	.159	.081	.123	89	52	47	63	Calm.	W	N b W	N 68 W	0.0	13.4	3.0	2.40	4.42	...	...
28	.798	.668	.614	.6915	26.5	28.6	26.1	26.58	— 7.47	.126	.138	.124	.127	88	87	88	89	Calm.	E N E	Calm.	N 18 E	0.0	3.0	0.0	0.80	1.15	...	3.6
29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N b W	W b N	N N W	N 53 W	0.4	0.6	3.0	1.61	2.28	...	...
30	.741	.700	.496	.6298	21.8	31.9	29.0	28.08	— 6.73	.099	.136	.147	.130	84	75	92	84	N b W	E b N	E b N	N 67 E	9.6	15.2	18.0	9.12	11.17	...	1.5
31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E b N	E N E	W b S	N 67 E	20.0	8.0	21.0	7.58	14.13	0.530	3.7
	29.6842	29.6532	29.6531	29.6621	15.04	24.60	19.50	19.92	—10.05	.081	.090	.092	.088	84	64	79	75	.....	.....	.....	.....	8.58	15.56	8.74	.....	10.48	0.700	16.3

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MARCH, 1872.

NOTE—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer .....29.965 at 11 p m. on 24th } Monthly range=
Lowest Barometer.....28.789 at 2 p.m. on 31st } 1.176.

Self-registering Ther.
- Maximum Temperature ..... 46°4 on 27th } Monthly range=
- Minimum Temperature ..... —10°8 on 5th } 57°2
- Mean Maximum Temperature .....29°80 } Mean daily range=
- Mean Minimum Temperature .....12°41 } 17°39
- Greatest daily range.....36°0 from a.m. to p.m of 4th.
- Least daily range ..... 8°1 from a m. to p m. of 10th.

Warmest Day..... 27th ... Mean Temperature.....33°50 }
Coldest Day..... 5th ... Mean Temperature.....—1°98 } Difference=35°48

Maximum Solar ..... 66°0 on 27th } Monthly range=
Radiation. Terrestrial.....—17°4 on 5th } 83°4

Aurora observed on 4 nights, viz., 1st, 6th, 12th, and 15th.

Possible to see Aurora on 17 nights; impossible on 14 nights.

Snowing on 14 days; depth 16.3 inches; duration of fall 68.3 hours.

Raining on 2 days; depth 0.700 inches; duration of fall 24.0 hours.

Mean of Cloudiness=0.54.

WIND.

Resultant Direction N. 66° W.; Resultant Velocity 5.36 miles.

Mean Velocity 10.48 miles per hour.

Maximum Velocity 37.0 miles, from 1.30 to 2.30 p.m. of 6th.

Most Windy day 6th; Mean Velocity 23.25 miles per hour.

Least Windy day 28th; Mean Velocity 1.15 miles per hour.

Most Windy hour 2 p.m.; Mean Velocity 15.03 miles per hour.

Least Windy hour 2 a.m.; Mean Velocity 7.85 miles per hour.

Fog on 9th.

Solar haloes 2nd, 3rd, 18th, and 22nd.

Lunar haloes 22nd and 24th.

March 30th—Robins seen.

It will be seen by the Comparative Table that this is the coldest March ever recorded at this Observatory.

COMPARATIVE TABLE FOR MARCH.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity
	°	°	°	°	°					°		
1844	31.3	+ 1.6	50.8	9.6	41.2	8	2.470	8	14.0	...	...	0.57 lbs
1845	37.4	+ 5.7	62.7	6.6	56.1	5	inap.	8	2.8	...	...	0.66
1846	33.1	+ 3.4	49.6	8.3	41.3	9	1.965	5	2.3	...	...	0.30
1847	26.2	— 3.5	43.9	5.6	38.3	5	0.850	6	4.2	...	...	0.71
1848	28.6	— 1.1	58.6	0.0	58.6	5	1.220	6	9.7	N 66 w	2.06	5.80mls
1849	33.5	+ 3.8	53.0	15.1	37.9	7	1.525	2	2.3	N 3 w	1.48	5.37
1850	29.8	+ 0.1	46.5	7.2	39.3	2	0.745	7	11.2	N 52 w	2.62	7.62
1851	32.4	+ 2.7	59.3	12.0	47.3	3	0.770	9	8.8	N 21 w	1.93	7.65
1852	27.7	— 2.0	44.8	—7.4	52.2	8	3.080	12	19.5	N 8 w	0.71	5.81
1853	30.6	+ 0.9	56.3	0.0	56.3	6	1.080	8	7.1	N 58 w	2.60	5.96
1854	30.7	+ 1.0	55.1	7.4	47.7	9	2.425	3	2.8	N 55 w	3.39	8.03
1855	28.5	— 1.2	49.4	—2.9	52.3	5	1.485	11	18.1	N 88 w	4.76	9.95
1856	23.1	— 6.6	41.4	-14.0	55.4	0	0.000	12	16.2	N 71 w	7.68	11.39
1857	27.8	— 1.9	57.6	—5.5	63.1	4	0.335	15	11.3	N 63 w	6.63	10.84
1858	28.4	— 1.3	55.4	—5.5	60.9	10	0.917	6	0.2	N 48 w	5.45	8.56
1859	36.3	+ 6.6	54.2	9.8	44.4	15	4.054	8	1.0	N 64 w	1.96	10.39
1860	34.5	+ 4.8	67.0	12.8	54.2	5	0.882	11	2.4	N 64 w	7.61	12.41
1861	26.9	— 2.8	47.4	—5.2	52.6	8	2.125	14	7.1	N 54 w	4.33	10.56
1862	28.8	— 0.9	43.2	8.0	35.2	8	2.560	11	18.5	N 12 w	2.50	9.38
1863	25.5	— 3.9	42.2	—4.0	46.2	4	0.687	17	11.4	N 27 w	2.62	9.27
1864	29.1	— 0.6	50.2	3.0	47.2	9	1.620	12	3.7	N 53 w	2.29	8.41
1865	33.6	+ 3.9	55.6	—3.5	59.1	10	3.050	12	18.9	N 61 w	2.16	8.80
1866	27.6	— 2.1	45.8	7.5	38.3	8	1.915	18	7.2	N 73 w	6.84	11.51
1867	26.6	— 3.1	46.8	3.0	43.8	6	0.617	14	33.4	N 34 w	2.12	8.52
1868	31.3	+ 1.6	59.0	-15.6	74.6	7	2.660	5	4.2	N 21 w	2.12	8.58
1869	23.1	— 6.6	46.8	—5.4	52.2	3	0.985	9	15.0	N 52 w	2.86	8.02
1870	26.3	— 3.4	44.0	5.2	38.8	2	0.755	18	62.4	N 18 E	4.73	10.13
1871	34.7	+ 5.0	58.5	17.0	41.5	8	2.782	12	13.0	N 31 w	2.59	8.31
1872	19.9	— 9.8	46.4	-10.8	57.2	2	0.700	14	16.3	N 66 w	5 36	10.48
Resu'ts to 1871.	29.68	...	51.61	2.47	49.14	6.24	1.618	10.00	12.22	N 49 w	3.14	8.80
Excess for '72.	— 9.76	...	— 5.21	— 13.27	+ 8.06	— 4.24	— 0.918	+ 4.00	+ 4.08	...	...	+ 1.68

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—APRIL, 1872.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6. A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10P.M	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEN.		
	°	°	°	°	°	°	°	°	°																		
1	29.268	29.493	29.691	29.5050	25.0	33.7	29.0	29.60	— 6.00	.109	.145	.140	.126	81	75	88	77	W N W	W N W	W b S	N 75 W	16.4	22.5	6.5	17.38	17.51	...	0.1
2	.763	.717	.652	.7107	23.6	36.9	34.4	32.30	— 3.68	.111	.150	.174	.143	89	63	87	78	W b N	S S E	Calm.	N 80 W	7.5	2.8	0.0	3.48	4.45	...	...
3	.764	.838	.910	.8403	27.5	33.3	28.3	30.18	— 6.1[illegible]	.121	.098	.085	.102	81	51	54	61	N W	N W b W	N N W	N 39 W	10.6	21.5	16.0	15.08	15.61	...	...
4	.957	.904	.877	.9123	24.6	37.6	31.1	31.85	— 4.88	.114	.132	.138	.130	86	59	79	73	N W b N	N W b W	N W b W	N 40 W	1.8	14.8	4.0	8.21	8.41	...	...
5	.867	.778	.700	.7727	25.0	44.9	36.2	36.20	— 0.93	.121	.159	.165	.150	91	52	77	72	Calm.	S b W	Calm.	S 16 W	0.0	3.0	0.0	2.60	2.89	...	...
6	.680	.610	.491	.5838	31.5	52.4	41.6	42.98	+ 5.48	.140	.151	.139	.146	79	38	53	55	Calm.	Calm.	N E b E	N 74 E	0.0	0.0	10.4	3.17	3.21	...	...
7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E b E	E N E	N E b E	N 59 E	6.4	8.8	0.6	5.89	5.90	0.190	...
8	.489	.454	.340	.4223	39.4	43.4	43.8	42.08	+ 3.80	.240	.264	.255	.255	99	93	89	95	N E b [illegible]	E N E	N E b E	N 65 E	0.6	8.0	16.5	7.19	8.02	.020	...
9	.109	.091	.151	.1182	45.9	59.6	54.6	53.55	+14.88	.296	.401	.287	.317	96	79	66	78	E b N	S	W	S 11 E	4.2	4.8	17.5	1.05	8.64	.005	...
10	.278	.376	.624	.4363	41.6	39.8	34.4	38.23	— 0.80	.225	.163	.174	.182	87	67	88	79	W S W	W b S	W b S	S 78 W	11.0	23.2	13.6	18.69	18.95	Inap.	Inap.
11	.765	.880	.823	.8268	31.3	45.2	37.6	39.00	— 0.42	.157	.155	.157	.155	89	50	69	66	W S W	S b W	E N E	S 82 W	3.0	8.5	6.2	4.49	8.00	...	...
12	.638	.492	.441	.5195	37.6	37.3	43.0	40.25	+ 0.45	.175	.211	.247	.201	77	95	89	80	E N E	E N E	W	N 70 E	8.6	10.0	4.0	7.02	11.14	.280	...
13	.474	.451	.598	.5160	39.4	47.7	33.7	40.62	+ 0.43	.176	.141	.137	.151	73	42	70	60	S W b S	W	S W	S 79 W	17.2	33.2	3.6	17.89	19.39	...	...
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W b N	W b N	W b N	N 72 W	24.8	24.4	0.6	19.48	19.53	...	...
15	.705	.540	.595	.6123	29.3	32.2	31.9	30.95	— 9.98	.144	.126	.122	.134	89	68	67	77	N b E	N E	N N W	N 22 E	6.8	4.2	12.4	5.60	6.58	...	0.1
16	.800	.866	.870	.8533	28.2	41.2	34.7	35.45	— 5.87	.136	.128	.104	.127	87	49	50	63	N W b N	N W b W	N b W	N 31 W	14.0	17.6	8.0	12.36	12.71	...	...
17	.830	.680	.622	.7003	28.6	46.3	34.0	36.85	— 4.85	.135	.132	.133	.136	87	41	68	65	Calm.	S b W	Calm.	S 5 W	0.0	9.6	0.0	3.86	4.51	...	...
18	.481	.304	.236	.3283	31.9	46.7	39.4	40.65	— 1.49	.143	.089	.118	.114	79	27	48	46	N E	E b N	N W	N 61 E	4.0	11.5	5.0	4.13	6.05	...	...
19	.274	.260	.401	.3163	33.3	54.6	44.1	46.12	+ 3.68	.150	.254	.188	.190	78	59	64	62	W b S	S b W	N	S 85 W	1.0	11.0	6.2	4.61	9.55	...	...
20	.507	.515	.503	.5000	37.3	47.0	40.9	42.50	— 0.32	.161	.123	.220	.161	72	37	86	60	N N W	E S E	Calm	N 84 E	1.6	6.6	0.0	3.73	5.30	...	...
21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E b N	E	W b N	S 69 W	2.4	8.7	20.4	1.93	7.65	.130	...
22	.632	.676	.754	.6905	28.2	32.2	27.9	29.37	—14.18	.100	.118	.117	.108	65	64	76	66	W N W	W b S	W b S	N 81 W	20.0	20.6	2.0	17.20	17.38	...	Inap.
23	.675	.497	.425	.5128	28.2	34.4	36.6	34.93	— 9.02	.136	.174	.212	.182	87	87	98	89	W S W	Calm.	Calm.	S 38 W	2.0	0.0	0.0	2.33	4.73	.280	0.5
24	.483	.576	.587	.5500	34.0	47.2	35 5	38.95	— 5.32	.191	.261	.185	.212	98	80	89	89	Calm	S S E	Calm.	S 86 E	0.0	0.5	0.0	0.49	0.58	Inap	...
25	.566	.460	.430	.480[illegible]	36.5	63.2	61.8	54.10	+ 9.45	.184	.282	.245	.246	87	48	44	62	Calm.	S W b S	S W	S 42 W	0.0	9.0	2.6	2.70	2.78	...	...
26	.373	.509	.643	.5142	68.9	64.3	50.3	58.25	+13.23	.305	.146	.152	.203	61	24	41	41	W S W	N W b W	N W b W	N 67 W	6.5	20.2	7.6	15.41	16.14	...	...
27	.737	.744	.756	.7497	41.6	54.6	44.9	47.85	+ 2.43	.147	.154	.130	.145	56	36	43	44	N W b N	S b W	N b W	N 36 W	12.4	6.8	14.0	7.06	9.68	...	...
28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	S E b S	N N W	N 65 E	8.0	3.4	0.8	3.20	6.01	...	...
29	.932	.908	.820	.8818	41.6	49.9	45.2	46.23	+ 0.13	.156	.121	.126	.133	59	33	41	43	E N E	E N E	E N E	N 76 E	2.5	8.8	11.2	6.71	6.94	...	...
30	.735	.628	.549	.6322	43.4	62.3	51.3	53.42	+ 6.93	.188	.227	.298	.256	66	40	71	64	N E b E	E b S	Calm.	N 73 E	4.8	12.6	0.0	5.06	5.44	.005	...
	29.6070	29.5834	29.5957	29.5958	34.36	45.69	39.47	40.48	— 0.61	.164	.173	.171	.169	81	56	69	67	.....	....	.....	.....	6.60	11.22	6.32	.....	9.12	0.910	0.7

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR APRIL, 1872

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.970 at 8 a.m. on 4th. } Monthly range=
Lowest Barometer.....29.091 at 8 a.m. on 9th. } 0.879.

Self-registering Ther.
- Maximum temperature.....70°0 on 26th. } Monthly range=
- Minimum temperature.....22°7 on 2nd. } 47°3
- Mean maximum temperature.....49°97 } Mean daily range=
- Mean minimum temperature.....31°35 } 18°62
- Greatest daily range.....57°8 from a.m. to p.m. of 25th.
- Least daily range.....5°2 from a.m. to p.m. of 15th.

Warmest day.....26th; mean temperature.....58°25 } Difference=28°88.
Coldest day.....22nd; mean temperature.....29°37 }

Maximum { Solar.....85°0 on 25th. } Difference=73°6.
Radiation { Terrestrial.....11°4 on 23rd. }

Aurora observed on 8 nights, viz.:—3rd, 10th, 11th, 14th, 15th, 17th, 26th, and 30th.

Possible to see Aurora on 20 nights; impossible on 10 nights.

Snowing on 5 days; depth, 0.7 inches; duration of fall, 5.4 hours.

Raining on 9 days; depth, 0.910 inches; duration of fall, 40.9 hours.

Mean of cloudiness=0.54.

WIND.

Resultant direction, N. 68° W.; resultant velocity, 3.84 miles.

Mean velocity, 9.12 miles per hour.

Maximum velocity, 36.6 miles, from noon to 1 p.m. of 13th.

Most windy day, 14th; mean velocity, 19.53 miles per hour.

Least windy day, 24th; mean velocity, 0.58 miles per hour.

Most windy hour, 3 p.m.; mean velocity, 12.96 miles per hour.

Least windy hour, 10 p.m.; mean velocity, 5.76 miles per hour.

Fog on 8th, 9th, 23rd and 24th.

Solar haloes, 4th, 5th, 17th, and 27th.

Lunar haloes, 15th and 16th.

9th. First vessel entered harbour. 5th. Blue birds. 6th. Swallows. 10th. Pigeons in large numbers. 25th. Frogs heard. 26th. Butterflies.

COMPARATIVE TABLE FOR APRIL.

YEAR.	TEMPERATURE. Mean.	Excess above Average	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°							
1844	47.5	+ 6.4	74.6	14.9	59.7	10	1.515	1	Inap.	...	...	0.24 lbs.
1845	42.1	+ 1.0	66.7	15.5	51.2	11	3.290	4	1.5	...	...	1.00
1846	44.0	+ 2.9	81.8	24.2	57.6	10	1.300	2	1.3	...	...	0.55
1847	39.2	— 1.9	65.1	9.3	55.8	8	2.870	2	4.0	...	...	0.59
1848	41.3	+ 0.2	65.1	22.7	42.4	5	1.455	1	0.5	N 77 W	1.46	4.89mls.
1849	39.0	— 2.1	72.0	15.5	56.5	10	2.655	2	1.7	N 43 W	3.14	7.50
1850	37.9	— 3.2	65.7	18.0	47.7	7	4.720	2	1.1	N 50 E	1.12	7.64
1851	41.3	+ 0.2	59.3	25.8	33.5	11	2.295	3	1.2	N 14 E	2.52	8.07
1852	38.2	— 2.9	53.8	20.0	33.8	6	1.990	4	9.4	N 23 E	2.44	6.68
1853	41.9	+ 0.8	65.7	25.0	40.7	10	2.625	1	1.0	N 12 W	1.95	5.20
1854	41.0	— 0.1	64.5	20.2	44.3	12	2.685	4	2.7	N 50 E	2.57	6.81
1855	42.4	+ 1.3	69.4	10.7	58.7	8	2.030	3	1.6	N 36 W	3.99	7.57
1856	42.3	+ 1.2	72.2	14.2	58.0	13	2.780	3	0.1	N 29 E	1.64	6.05
1857	35.4	— 5.7	52.0	5.9	46.1	10	1.755	11	12.9	N 60 W	4.15	10.24
1858	41.5	+ 0.4	65.2	21.8	43.4	13	1.642	2	0.1	N 14 W	1.74	9.57
1859	39.5	— 1.6	64.8	22.6	42.2	9	2.527	8	1.2	N 36 W	2.38	10.79
1860	39.5	— 1.6	61.8	19.5	42.3	11	1.282	5	0.3	N 37 W	4.10	10.30
1861	42.0	+ 0.9	67.0	23.8	43.2	12	1.619	4	6.9	N 37 E	2.31	8.90
1862	39.6	— 1.5	68.0	14.5	53.5	10	2.235	4	0.2	N 50 E	2.48	9.77
1863	42.0	+ 0.9	69.0	8.6	60.4	8	2.210	4	1.6	N 14 E	3.75	9.20
1864	40.9	— 0.2	59.4	28.1	31.3	16	3.633	3	3.5	N 41 E	3.39	7.77
1865	43.1	+ 2.0	62.5	23.0	39.5	17	3.972	6	2.0	N 84 W	2.11	8.39
1866	43.9	+ 2.8	71.0	28.5	42.5	7	1.675	2	Inap.	N 42 W	3.34	7.95
1867	39.5	— 1.6	65.5	25.4	40.1	12	2.147	5	7.2	N 51 W	2.68	7.89
1868	38.0	— 3.1	64.0	9.2	54.8	7	0.990	10	5.3	N 63 W	2.43	9.24
1869	40.1	— 1.0	72.2	16.6	55.6	9	2.965	6	0.5	N 59 W	4.03	8.91
1870	44.6	+ 3.5	67.0	29.6	37.4	9	2.145	2	0.1	N 40 E	3.55	7.03
1871	43.0	+ 1.9	72.8	26.4	46.4	17	3.318	2	1.3	N 48 W	1.86	8.85
1872	40.5	— 0.6	70.0	22.7	47.3	9	0.910	5	0.7	N 68 W	3.84	9.12
Results to 1871.	41.13	.....	66.36	19.27	47.09	10.00	2.439	3.63	2.39	N 18 W	2.04	8.13
Exc. for 1872.	— 0.65	.....	+ 3.64	+ 3.43	+ 0.21	— 1.00	— 1.529	+ 1.37	— 1.69	...	...	+ 0.99

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MAY, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	MEAN		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN		
					°	°	°	°	°												°							
1	29.433	29.400	29.458	29.4230	52.4	53.9	45.2	50.08	+ 3.23	.337	.371	.277	.326	86	90	92	89	Calm.	S S W	Calm.	S 16 W	0.0	7.8	0.0	3.19	3.74	0.310	...
2	.426	.459	.633	.5103	44.1	51.3	38.0	44.67	— 2.52	.273	.207	.170	.221	94	54	73	74	S W b S	W b S	S W b W	S 79 W	2.0	17.8	1.2	7.56	8.32	.025	...
3	.553	.286	.428	.4323	40.5	43.8	37.3	40.45	— 7.10	.225	.256	.187	.207	89	90	84	82	Calm.	S S W	N W	S 81 W	0.0	9.0	21.4	7.21	11.31	.130	...
4	.697	.848	.913	.8357	36.2	47.0	37.6	40.52	— 7.38	.167	.158	.175	.168	78	49	77	68	N W	N W	N W b N	N 38 W	21.4	28.0	7.4	18.61	18.66	Inap.	...
5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S	Calm.	S 22 W	0.0	8.6	0.0	2.56	5.12	...	...
6	.720	.641	.658	.6710	45.9	64.2	51.0	55.77	+ 7.12	.228	.246	.230	.236	73	40	61	54	Calm.	S E	N E b E	S 55 E	0.0	6.0	1.8	1.55	2.06	...	...
7	.667	.630	.695	.6643	46.6	75.1	62.2	62.03	+13.05	.269	.477	.402	.379	85	55	72	67	Calm.	Calm.	Calm.	N 11 W	0.0	0.0	0.0	0.83	1.06	...	...
8	.765	.761	.627	.7090	53.5	51.3	47.7	50.83	+ 1.50	.333	.266	.264	.289	81	70	80	78	N b E	N E b N	Calm.	N 58 E	3.6	7.0	0.0	4.09	5.38	.020	...
9	.491	.341	.506	.4450	45.9	70.8	55.7	57.77	+ 8.08	.278	.415	.325	.332	90	55	73	70	Calm.	S W b S	N W b W	S 78 W	0.0	13.4	16.4	5.63	7.82	...	...
10	.718	.764	.709	.7242	45.2	48.8	46.6	46.75	— 3.30	.237	.250	.269	.247	77	72	85	77	Calm.	S E b E	N E b E	N 34 E	0.0	5.2	6.2	3.10	4.98	...	...
11	.550	.453	.391	.4500	49.2	58.6	62.9	55.63	+ 5.23	.254	.330	.347	.316	72	67	60	71	E b N	Calm.	S W b W	S 81 E	9.8	0.0	16.4	1.95	6.01	Inap.	...
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W N W	S	N N W	N 85 W	18.6	7.2	2.8	7.94	10.34	...	...
13	.649	.681	.742	.6942	38.0	51.3	44.8	45.98	— 5.12	.186	.287	.196	.226	81	76	66	72	N W b W	S S W	N W b N	N 55 W	3.4	5.6	2.5	1.50	3.88	...	...
14	.807	.808	.829	.8155	41.2	59.6	50.6	51.32	— 0.12	.178	.286	.265	.246	68	55	72	64	N W	S E b S	N E	S 80 E	2.4	7.0	4.6	1.86	5.02	...	...
15	.892	.888	.864	.8815	49.9	58.6	51.7	53.45	+ 1.67	.264	.299	.220	.252	73	60	57	61	N N E	S	N W b N	N 16 E	9.6	6.6	6.6	1.39	5.00	...	...
16	.914	.844	.728	.8200	48.8	56.0	44.8	50.78	— 1.35	.250	.246	.224	.255	72	55	76	69	E N E	S E	Calm.	S 85 E	6.2	4.5	0.0	3.33	4.85	...	...
17	.686	.581	.498	.5770	45.9	57.1	47.9	51.67	— 0.82	.173	.179	.137	.154	55	38	40	40	Calm.	E b S	N E b E	S 89 E	0.0	5.8	3.0	3.41	5.48	...	...
18	.429	.293	.185	.2882	48.5	63.2	53.5	54.35	+ 1.53	.215	.270	.344	.278	62	47	84	67	E b N	E b N	E	N 78	4.4	13.8	9.5	6.92	7.11	.040	...
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E.	W b S	W	N 81 E	12.2	18.6	0.8	2.86	9.34	.720	...
20	.126	.195	.343	.2357	48.1	60.4	51.3	53.08	— 0.45	.297	.392	.342	.349	89	74	91	87	Calm.	S W	Calm.	S 53 W	0.0	5.8	0.0	2.24	2.51	.090	...
21	.484	.557	.579	.5418	48.1	63.6	53.9	55.08	+ 1.22	.309	.433	.212	.317	91	73	51	72	Calm.	S S W	N W	S 79 W	0.0	3.5	0.8	1.36	2.23	...	...
22	.568	.461	287	.4200	50.3	53.5	50.6	52.53	— 1.67	.249	.312	.340	.325	68	76	93	83	Calm.	E N E	N N E	N 74 E	0.0	6.5	2.0	3.48	3.63	.232	...
23	.273	.425	.479	.4038	55·0	65.8	51.3	58.02	+ 3.47	.378	.379	.362	.367	88	60	96	78	N W b N	N N W	Calm.	N 33 W	10.8	11.8	0.0	7.47	7.52	...	...
24	.477	.298	.274	.3365	46.7	56.4	48.5	49.98	— 4.92	.306	.371	.314	.329	96	82	97	91	Calm.	E b S	Calm.	S 79 E	0.0	8.6	0.0	1.89	2.04	.045	...
25	.422	.498	.592	.5135	50.6	64.3	47.7	54.75	— 0.48	.307	.362	.255	.293	83	60	77	68	W b N	W	Calm.	N 77 W	22.0	22.0	0.0	17.27	17.61	...	...
26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	E b S	E S E	S 57 E	0.0	9.6	3.6	2.00	3.46	Inap.	...
27	.271	.212	.320	.2737	55.3	60.7	53.5	55.73	—0.17	.386	.387	.344	.367	88	72	83	82	Calm.	S E	W b N	S 55 W	0.0	2.2	4.4	1.95	3.41	.320	...
28	.420	.490	.584	.5120	45.9	53.9	45.2	48.70	—7.52	.248	.253	.246	.251	80	60	82	73	N W	N W b W	Calm.	N 60 W	21.2	20.6	0.0	14.62	14.83	...	...
29	.625	.667	.712	.6677	47.0	63.6	47.7	53.37	—3.18	.244	.288	.264	.266	76	48	80	67	N W	N N W	Calm.	N 46 W	13.2	13.0	0.0	5.34	6.77	...	...
30	.676	.677	.726	.6962	48.1	55.3	52.1	51.77	—5.10	.268	.332	.287	.298	80	75	73	77	N E	N b E	N W	N 16 E	3.0	8.0	13.0	2.72	3.84	.002	...
31	.782	.749	.706	.7670	51.0	62.9	51.0	56.33	—0.83	.260	.298	.220	.270	69	52	59	60	N N W	N b W	N W	N 27 W	13.0	5.4	1.2	9.81	9.96	...	...
	29.5749	29.5514	29.5750	29.5670	47.33	58.19	49.27	51.90	— 0.19	.264	.309	.267	.280	79	63	75	72	.....	.....	.....	.....	5.70	9.32	4.05	.....	6.49	1.934	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MAY, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.976 at 7 a.m. on 5th
Lowest Barometer.....28.941 at 7 a.m. on 19th } Monthly range= 1.035.

Self-registering Ther.
- Maximum temperature.....78°8 on 7th.
- Minimum temperature.....32°0 on 3rd. } Monthly range= 46°8
- Mean maximum temperature.....67°97
- Mean minimum temperature.....41°38 } Mean daily range= 20°59.
- Greatest daily range.....36°8 from a.m. to p.m. of 7th.
- Least daily range.....12°2 from a.m. to p.m. of 28th.

Warmest day.....7th; mean temperature.....62°03
Coldest day.....3rd; mean temperature.....40°45 } Difference=21°58

Maximum Solar Radiation.....94°4 on 7th
Terrestrial.....23°0 on 2nd and 3rd } Difference=71.4.

Aurora observed on 6 nights, viz:—2nd, 9th, 13th, 24th, 27th and 29th
Possible to see Aurora on 25 nights; impossible on 6 nights.
Raining on 14 days; depth, 1.934 inches; duration of fall, 53.9 hours.
Mean of cloudiness=0.54.

WIND.

Resultant direction, N. 52° W.; resultant velocity, 2.25 miles.
Mean velocity, 6.49 miles per hour.
Maximum velocity, 32.0 miles, from 3.30 to 4.30 p.m. of 3rd.
Most windy day, 4th; mean velocity, 18.66 miles per hour.
Least windy day, 7th; mean velocity, 1.00 miles per hour.
Most windy hour, 3 p.m.; mean velocity, 9.22 miles per hour.
Least windy hour, 9 p.m.; mean velocity, 3.83 miles per hour.

Fog on the 23rd, 24th and 27th.
Lightning on 9th and 11th.
Thunder storms on 1st and 27th.
Solar haloes, 11th and 15th,
Lunar haloes, 15th and 24th.
Ice on 4th. Hoar frost 13th.

COMPARATIVE TABLE FOR MAY.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of Days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°	°	
1844	53.6	+ 2.0	78.4	28.7	49.7	14	5.670	0	0.0	...	...	0.30 lbs.
1845	49.6	— 2.0	77.8	27.8	50.0	8	2.300	0	0.0	...	...	0.55
1846	55.5	+ 3.9	79.7	33.1	46.6	9	4.375	0	0.0	...	...	0.46
1847	54.4	+ 2.8	72.1	26.7	45.4	12	2.040	0	0.0	...	...	0.29
1848	54.1	+ 2.5	78.0	31.3	46.7	13	2.520	0	0.0	N 40 W	1.31	4.93 mls.
1849	48.0	— 3.6	72.2	27.9	44.3	16	5.115	0	0.0	N 51 E	1.97	5.33
1850	47.6	— 4.0	77.8	27.5	50.3	7	0.545	1	Inap.	N 64 W	2.05	6.32
1851	51.3	— 0.3	73.3	28.0	45.3	12	2.950	1	0.5	N 32 W	1.59	6.34
1852	51.4	— 0.2	73.3	32.0	41.3	7	1.125	1	Inap.	S 82 W	0.99	4.00
1853	50.9	— 0.7	78.4	32.2	46.2	17	4.420	1	Inap.	N 2 W	0.83	5.16
1854	52.2	+ 0.6	71.4	25.2	46.2	11	4.630	0	0.0	E	0.40	5.38
1855	53.1	+ 1.5	77.5	33.0	44.5	6	2.565	2	0.9	N 1 W	2.76	5.93
1856	50.5	— 1.1	82.2	31.2	51.0	14	4.580	1	Inap.	N 4 E	3.99	9.81
1857	48.9	— 2.7	74.8	26.0	48.8	15	4.145	1	Inap.	N 23 W	1.14	8.13
1858	48.9	— 2.7	69.8	31.0	38.8	17	6.367	0	0.0	N 42 E	3.33	9.30
1859	55.2	— 3.6	79.6	39.5	40.1	11	3.410	0	0.0	N 72 E	1.59	5.70
1860	55.5	— 3.9	74.5	32.5	42.0	16	1.815	0	0.0	N 26 E	2.66	7.17
1861	47.5	— 4.1	73.0	28.0	45.0	12	3.380	1	0.5	N 47 W	3.60	9.17
1862	52.2	+ 0.6	78.5	32.4	46.1	8	1.427	0	0.0	N 52 W	2.80	7.87
1863	54.3	+ 2.7	79.0	36.4	42.6	14	3.363	1	0.1	N 56 E	0.41	5.89
1864	54.8	+ 3.2	79.0	32.2	46.8	18	4.070	0	0.0	N 7 W	1.86	5.64
1865	52.3	+ 0.7	79.0	30.0	49.0	11	4.005	0	0.0	N 3 W	1.65	5.48
1866	48.3	— 3.3	73.4	33.4	40.0	13	2.820	0	0.0	N 46 W	4.49	9.26
1867	46.5	— 5.1	65.0	24.6	40.4	18	3.220	1	Inap.	N 51 W	3.55	8.40
1868	51.8	+ 0.2	73.0	33.2	39.8	16	7.670	0	0.0	N 38 E	3.16	6.87
1869	50.8	— 0.8	74.2	31.4	42.8	16	2.805	1	Inap.	N 20 W	2.38	6.55
1870	56.3	+ 4.7	81.2	38.8	42.4	10	1.150	0	0.0	N 23 E	1.09	5.48
1871	54.2	+ 2.6	85.0	32.4	52.6	7	2.302	0	0.0	N 23 W	2.53	7.70
1872	51.9	+ 0.3	78.8	32.0	46.8	14	1.934	0	0.0	N 52 W	2.25	6.49
Res'lts to 1871.	51.63	.....	76.11	30.94	45.17	11.85	3.254	0.37	0.07	N 12 W	1.63	6.74
Excess for 1872	+ 0.27	.....	+ 2.69	+ 1.06	+ 1.63	+ 2.15	— 1.320	— 0.37	— 0.07	...	...	— 0.25

MONTHLY METEROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JUNE, 1872.

Latitude—43°39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal	Tension of Vapour.				Relative Humidity				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A. M.	2 P. M.	10 P. M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A. M.	2 P. M.	10 P. M.	M'N.	6 A. M.	2 P. M.	10 P. M.	M'N.	6 A. M.	2 P. M.	10 P. M.		6 A. M.	2 P. M.	10 P. M.	Res'l-tant.	MEAN		
1	29.748	29.634	29.644	29.6683	° 55.7	° 64.3	° 52.8	° 56.87	— ° 0.63	.260	.339	.331	.284	58	56	83	62	N W b W	N W b W	Calm	N 62 W	5.0	14.6	0.0	5.23	6.67	0.010	...
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N N E	S	E	S 53 E	2.2	5.4	3.0	1.96	4.21	...	...
3	.730	.652	.505	.6122	51.0	60.4	55.7	56.90	— 1.22	.260	.286	.261	.282	69	55	59	61	E	E	E N E	N 80 E	7.0	12.8	3.0	7.31	7.52	...	...
4	.289	.310	.418	.3435	48.4	53.5	50.6	51.27	— 7.20	.274	.371	.275	.318	81	91	75	84	Calm.	N W b N	N W b W	N 30 W	0.0	21.8	10.0	9.92	10.16	.240	...
5	.510	.495	.509	.5035	55.3	73.3	58.6	63.05	+ 4.28	.255	.267	.309	.276	58	33	62	50	N N W	N	Calm	N 11 W	10.0	11.2	0.0	8.06	8.27	...	...
6	.542	.484	.466	.4937	52.1	74.1	57.5	61.95	+ 2.87	.307	.453	.348	.366	79	53	73	66	Calm	S b E	Calm	S 7 W	0.0	2.6	0.0	0.91	0.94	...	...
7	.446	.318	.164	.2947	57.1	53.5	54.6	55.07	— 4.33	.362	.399	.407	.393	77	97	95	91	Calm	E	N E	N 87 E	0.0	10.5	2.0	3.59	3.77	.520	...
8	.161	.241	.375	.2708	52.1	70.8	55.7	59.72	— 0.02	.373	.564	.392	.442	96	74	88	86	Calm	W b S	Calm	W	0.0	18.6	0.0	3.84	4.12	.005	...
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E b S	S S W	W S W	S 32 W	2.2	3.8	1.6	2.09	2.58	.282	...
10	.272	.254	.388	.3075	57.8	66.5	58.9	60.88	+ 0.52	.461	.538	.446	.482	96	83	90	90	S b E	S W b S	W S W	S 55 W	0.8	9.8	2.8	2.85	3.66	1.551	...
11	.458	.438	.429	.4345	60.7	79.5	65.4	67.63	+ 6.93	.459	.462	.421	.448	86	46	67	67	W	S W b W	S W	S 57 W	5.0	10.0	6.4	6.33	6.65	...	...
12	.448	.447	.503	.4645	66.8	74.8	61.1	66.78	+ 5.78	.536	.363	.321	.400	81	42	60	62	N W b W	W b N	N N E	W	3.4	26.0	3.0	7.40	8.67	...	...
13	.484	.374	.320	.3853	56.0	59.3	55.0	56.15	— 5.18	.353	.441	.414	.396	78	87	95	87	Calm	S b E	Calm	N 84 E	3.0	2.4	0.0	0.61	1.21	.540	...
14	.360	.358	.442	.3932	53.9	61.4	54.9	57.10	— 4.57	.416	.412	.337	.382	100	76	78	82	Calm	N E	N N W	S 49 W	0.0	2.4	1.6	0.15	1.57	inap.	...
15	.545	.533	.582	.5552	52.1	66.5	56.7	59.22	— 2.77	.307	.444	.346	.358	79	69	75	71	N W b W	S b W	N N E	N 66 W	3.2	5.8	4.0	2.44	4.17	...	...
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	S b W	Calm	N 28 W	1.0	0.4	0.0	0.30	0.88	...	...
17	.806	.813	.813	.8128	57.8	71.2	56.8	62.23	— 0.37	.388	.476	.344	.396	80	62	74	71	Calm	S b E	Calm	S 16 E	0.0	1.8	0.0	0.65	0.66	...	...
18	.871	.807	.756	.8015	59.6	74.8	58.2	64.57	— 1.65	.412	.402	.373	.401	81	47	76	67	Calm	S E b S	Calm	S 49 E	0.0	3.0	3.0	0.89	0.92	...	...
19	.767	.705	.701	.7187	60.4	74.8	65.0	68.10	+ 4.88	.439	.572	.506	.515	83	66	81	75	Calm	S E b S	Calm	S 34 E	3.0	3.0	0.0	0.68	0.83	...	...
20	.755	.711	.701	.7185	67.9	84.5	73.7	75.78	+12.27	.548	.709	.646	.641	80	60	78	72	Calm	S	Calm	S 22 W	0.0	7.2	0.0	2.21	2.35	...	...
21	.722	.760	.801	.7647	69.7	78.8	63.2	70.68	+ 6.88	.593	.375	.353	.463	82	38	61	62	Calm	N b W	Calm	N 17 W	0.0	12.5	0.0	6.04	6.10	...	...
22	.782	.743	.701	.7457	62.2	77.0	62.2	67.93	+ 3.83	.343	.342	.343	.334	61	37	61	51	N b W	N N W	N W b N	N 11 W	2.8	9.0	2.0	4.68	4.78	...	...
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm	S b E	Calm	N 64 E	0.0	2.0	0.0	0.23	1.21	...	...
24	.606	.598	.583	.5955	61.1	71.2	60.7	64.20	— 0.42	.442	.476	.422	.437	82	62	80	73	Calm	S E b E	N E b N	E	0.0	6.0	3.0	1.33	2.21	...	...
25	.573	.579	.627	.5948	59.6	68.1	61.4	64.00	— 0.90	.412	.571	.488	.505	80	83	89	84	N	S E b E	Calm	N 86 E	1.4	11.5	0.0	3.00	3.88	...	...
26	.645	.636	.631	.6348	65.8	75.0	65.4	69.12	+ 3.98	.548	.599	.514	.544	86	69	82	76	Calm	S	S E b E	S 7 W	0.0	5.5	0.5	1.43	1.44	...	...
27	.647	.631	.608	.6138	63.2	70.5	63.2	66.37	+ 0.98	.475	.599	.517	.548	82	85	80	89	Calm	E S E	Calm	S 71 E	0.0	7.2	0.0	2.65	2.78	...	...
28	.611	.566	.602	.5955	65.8	80.0	71.2	72.78	+ 7.13	.576	.689	.621	.628	90	67	81	78	Calm	S S W	W S W	S 16 W	0.0	14.2	0.6	4.70	4.97	...	...
29	.631	.636	.647	.6412	67.9	83.1	71.9	75.08	+ 9.22	.618	.729	.625	.662	91	65	80	77	S W	S S W	Calm	S 47 W	0.8	5.8	0.0	2.33	2.98	...	...
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S S W	Calm	S 26 W	1.4	8.8	0.0	3.39	3.71	...	...
	29.5764	29.5489	29.5566	29.5586	59.20	70.68	60.42	63.74	+ 1.73	.417	.475	.414	.436	81	64	77	73	....	.....	.....	.....	1.74	8.52	1.55	.....	3.80	3.148	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JUNE, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M, and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....29.871 at 6 a.m. on 18th. } Monthly range=
Lowest Barometer .....29.154 at mid. on 7th. } 0.717.

Self-registering Ther.
- Maximum temperature.....88°0 on 30th. } Monthly range=
- Minimum temperature..... 41.8 on 2nd. } 46°2
- Mean maximum temperature.....73°38 } Mean daily range=
- Mean Minimum temperature.....51°91 } 21°47
- Greatest daily range.....30°0 from a.m. to p.m. of 6th.
- Least daily range.....11°0 from a.m. to p.m. of 4th.

Warmest day.....20th; mean temperature 75°78 } Difference=24°51
Coldest day..... 3rd; mean temperature 51°27 }

Maximum Solar .....144°4 on 30th. } Monthly range=110°6
Radiation Terrestrial..... 33°8 on 2nd. }

Aurora observed on 8 nights, viz: 1st, 2nd, 10th, 13th, 15th, 22nd, 24th, and 25th.

Possible to see aurora on 6 nights; impossible on 24 nights.

Raining on 8 days; depth, 3.148 inches; duration of fall, 24.7 hours.

Mean of cloudiness, 0.51.

WIND.

Resultant direction, N. 69° W.; Resultant velocity, 0.76 miles.

Mean velocity, 3.80 miles per hour.

Maximum velocity, 26.0 miles, from 2 to 3 p.m. of 12th.

Most windy day, 4th; mean velocity, 10.16 miles per hour.

Least windy day, 17th; mean velocity, 0.66 miles per hour.

Most windy hour, 2 p. m.; mean velocity, 8.92 miles per hour.

Least windy hour, 3 a. m.; mean velocity, 1.24 miles per hour.

Dew on 8th, 16th, 17th, 18th, 19th, 20th, 23rd, 26th, 28th, and 29th.

Fog on 7th and 8th. Rainbows on 10th, 11th and 14th.

Thunderstorms on 9th, 10th, 11th and 13th.

Thunder or Lightning on 8th, 19th, 28th, and 30th.

COMPARATIVE TABLE FOR JUNE.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	V'lo city.	Mean Velocity.
	°	°	°	°	°					°		
1844	59.9	— 1.7	83.3	33.2	50.1	9	3.535	...	...	...	...	0.19 lbs.
1845	61.0	— 0.6	84.6	38.5	46.1	11	3.715	...	...	...	...	0.27
1846	63.3	+ 1.7	84.2	39.1	45.1	10	1.920	...	...	...	...	0.32
1847	58.4	— 3.2	77.8	36.7	41.1	14	2.625	...	...	...	...	0.30
1848	62.9	+ 1.3	92.0	37.4	54.6	8	1.810	...	...	N 61 W	1.90	4.51mls.
1849	63.2	+ 1.6	84.4	35.2	49.2	7	2.020	...	...	S 71 E	0.49	3.32
1850	64.3	+ 2.7	85.6	34.2	51.4	10	3.345	...	...	S 60 W	0.38	4.54
1851	59.2	— 2.4	79.2	37.0	42.2	11	2.695	...	...	S 2 W	1.26	4.42
1852	60.8	— 0.8	86.1	37.2	48.9	10	3.160	...	...	S 76 W	1.49	4.09
1853	65.5	+ 3.9	89.5	39.2	50.3	9	1.550	...	...	N 1 W	0.10	3.73
1854	64.1	+ 2.5	92.5	35.2	57.3	9	1.460	...	...	N 24 E	0.71	4.15
1855	59.9	— 1.7	91.5	36.2	55.3	17	4.070	...	...	N 69 W	1.33	5.70
1856	62.1	+ 0.5	89.2	42.0	47.2	13	3.200	...	...	S 21 W	0.90	5.30
1857	56.9	— 4.7	76.0	35.0	41.0	21	5.060	...	...	N 49 W	1.15	7.60
1858	66.2	+ 4.6	90.2	42.5	47.7	12	2.943	...	...	S 20 E	0.25	5.53
1859	58.3	— 3.3	86.4	32.2	54.2	16	4.085	2	inap.	N 77 E	1.95	7.19
1860	63.2	+ 1.6	81.6	49.2	32.4	14	2.136	...	...	N 44 W	3.13	7.61
1861	61.3	— 0.3	87.8	41.6	46.2	13	2.329	...	...	N 39 W	2.29	6.11
1862	60.5	— 1.1	85.4	39.4	46.0	10	1.007	...	...	N 26 W	1.77	5.98
1863	60.1	— 1.5	84.8	37.4	47.4	13	1.662	...	...	N 50 W	2.26	5.24
1864	63.0	+ 1.4	93.4	34.8	58.6	5	0.570	...	...	N 55 W	1.72	4.53
1865	64.5	+ 2.9	90.2	43.0	47.2	7	2.005	...	...	S 30 W	0.60	4.06
1866	60.2	— 1.4	90.5	40.0	50.5	15	2.720	...	...	S 15 W	0.71	5.09
1867	64.3	+ 2.7	88.6	44.0	44.6	8	0.885	...	...	S 84 E	0.48	4.13
1868	62.0	+ 0.4	84.2	38.0	46.2	11	2.217	...	...	N 16 E	0.85	5.26
1869	58.4	— 3.2	81.4	36.4	45.0	22	4.373	...	...	N 80 W	1.77	5.23
1870	67.3	+ 5.7	88.4	50.0	38.4	16	8.090	...	...	N 17 E	0.40	5.14
1871	61.4	— 0.2	83.0	41.8	41.2	13	3.340	...	...	N 80 W	2.04	6.57
1872	63.7	+ 2.1	88.0	41.8	46.2	8	3.148	...	...	N 69 W	0.76	3.80
Res'lts to 1871	61.61	.....	86.14	38.80	47.34	11.91	2.978	...	...	N 64 W	0.83	5.21
Excess for '72.	+ 2.13	.....	+ 1.86	+ 2.00	— 1.14	— 3.91	+ 0.170	...	...	...		— 1.41

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THE CANADIAN JOURNAL.

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THE IMPERFECTION OF THE PALÆONTOLOGICAL RECORD.

BY H. ALLEYNE NICHOLSON, M.D., D.Sc., M.A., F.R.S.E., F.G.S., &c.,
Professor of Natural History and Botany in University College, Toronto.

As I have pointed out shortly in a former communication, the series of the stratified formations is an incomplete one, and is likely ever to remain so. The causes of this "imperfection of the geological record," as it has been termed by Darwin, are various; but they are chiefly to be ascribed to our as yet limited knowledge of the geology of vast areas of the earth's surface, to denudation, and to the fact that many of the missing groups are buried beneath other deposits, whilst more than half of the superficies of the globe is hidden from us by the waters of the sea. The imperfection of the geological record necessarily implies an equal imperfection in the "palæontological record;" but, in truth, the record of life is far more imperfect than the mere physical series of deposits. The object, then, of this communication is briefly to consider some of the main causes of the numerous breaks and gaps in the palæontological record.

I. *Causes of the Absence of certain Animals in Fossiliferous deposits:*—In the first place, even if the series of stratified deposits had been preserved to us in its entirety, and we could point to sedimentary accumulations belonging to every period in the earth's history, there would still have been enormous gaps in the palæontological record, owing to the different facilities with which different

animals may be preserved as fossils. This subject is of such importance that we may shortly consider each of the primary sub-divisions of the animal kingdom separately from this point of view.

a. Protozoa:—As regards the sub-kingdom of the *Protozoa*, the entire classes of the *Infusorian Animalcules* and the parasitic *Gregarines*, from their absence of hard parts, must ever be unrepresented in a fossil condition. The same may be said of the *Monera* and *Amœbea*, though one or two of the latter are provided with structures which it is just possible might be preserved. The other three *Rhizopodous* orders, *viz.*, the *Foraminifera*, the *Radiolaria*, and the *Spongida* are composed of organisms in which hard structures of lime or flint are generally developed, and all these orders, therefore, have left traces of their existence in past time.

b. Cœlenterata:—Amongst the *Cœlenterate* Animals, the Fresh-water Polypes (*Hydra*), the Oceanic *Hydrozoa*, the Jelly-fishes (*Medusidæ*), the Sea-blubbers (*Lucernarida*), the Sea-anemones (*Actinidæ*), and the *Ctenophora* are all destitute of hard parts which could be preserved as fossils. The Sea-blubbers, however, supply us with an instance of how even a completely soft-bodied creature may leave traces of its former existence; for there is no doubt that impressions left by the stranded carcases of these animals have been detected in certain fine-grained rocks (*e. g.* the Solenhofen slates of Bavaria). On the other hand the Coralligenous Zoophytes, or "corals," (*Zoantharia sclerodermata* and *sclerobasica* and most of the *Alcyonaria*) possess hard parts capable of preservation; and the same is the case with most of the Hydroid Zoophytes. Accordingly there are few more abundant fossils than corals, whilst the large extinct group of the *Graptolites* is generally placed in the neighborhood of the Sea-firs (*Sertularians*).

c. Annuloida:—In this sub-kingdom the great class of the *Echinodermata* may be said to be represented more or less completely by all its orders. In the Sea-cucumbers (*Holothuroidea*), however, the calcareous structures so characteristic of the integument of the other Echinoderms are reduced to their minimum or are wholly wanting; and accordingly the evidence of the past existence of these creatures is of the most scanty description. The other great class of the *Annuloida*, (*viz.*, that of the *Scolecida*) comprises animals which are without exception destitute of hard parts, and which in many cases live parasitically in the interior of other animals (*e. g.*, the Tape-

worms, Suctorial-worms, Round-worms, &c). We are, therefore, without any geological evidence of the former existence of *Scolecids;* though no doubt can be reasonably entertained but that the group dates back to times long anterior to the present fauna.

d. Annulosa:—Many of the lower Annulose animals, such as Leeches, Earthworms, and Errant Annelides, possess no structure by which we could expect to get direct evidence of their past existence. The last of these, however, have left ample traces of their former presence in the form of burrows or tracks upon the mud or sea-sand; and the so-called "Tubicolar" Annelides are well represented by their investing tubes. In the case of the higher *Annulosa* another law steps in to regulate their comparative abundance as fossils. Most of the fossiliferous formations have been deposited in water, and of necessity, therefore, most fossils are the remains of animals naturally inhabiting water. As most deposits, also, are not only aqueous but are further marine, most fossils are those referable to sea-animals. It follows, therefore, that the remains of air-breathing animals, whether these be terrestrial or aërial, can only be preserved in an accidental manner, so to speak, as by falling or being blown into the water; except in the rare instances in which old land-surfaces have been buried up by sediment and thus partially kept for our inspection. In accordance with this law, the most abundant and important fossil Annulose Animals are *Crustaceans;* for these are not only generally aquatic in their habits, but are provided with a resisting shell or "exoskeleton." The air-breathing classes of the *Myriapods* (Centipedes and Millipedes), the *Arachnida* (Spiders and Scorpions) and the *Insecta* or true Insects, on the other hand, have been much less commonly and completely preserved; though many of them are perfectly capable of being fossilised. Almost all such remains as we have, however, of these three great classes are the remains of isolated individuals which may have been accidentally drowned; or else they occur in hollow trees, or in fragments of ancient soils, or in vegetable accumulations such as coal and peat. There are, however, some aquatic insects, and there are many insects the larvæ of which inhabit water; and we have not infrequent instances of their occurring as fossils.

e. Mollusca:—This sub-kingdom requires little notice, since the greater number of its members possess hard structures capable of being readily preserved in a fossil condition. Thus, the horny or

calcareous polypidoms of the *Polyzoa*, the shells of the Brachiopods, the true Bivalves and most of the Gasteropods, the hyaline shells of the Pteropods, the internal supports of the cuttle-fishes, and the chambered shells of the Tetrabranchiate Cephalopods, all occur commonly as fossils. The entire class of the Tunicaries, however, with one or two exceptions, presents no hard structures, and is hence unknown to the palæontologist. Amongst the *Gasteropoda*, again, the sea-slugs and their allies (*Nudibranchiata*) possess no shell and do not occur as fossils; whilst the shell of the land-slugs is extremely minute and is hardly known to have been preserved in sedimentary deposits. Lastly, the air-breathing Molluscs, from their habits, rarely occur as fossils; whilst those which inhabit rivers, ponds, and lakes are less largely represented than the marine forms, owing to the preponderance of salt-water deposits over those of fresh water.

f. Vertebrata:—The majority of Vertebrate animals possess a bony skeleton, so that their preservation as fossils—so far as this is concerned—is attended with no difficulty. Some of the Fishes, however, (such as the Lancelet, the Lampreys, and the Hag-fishes) have no scales, and either possess no skeleton or have one which is almost wholly cartilaginous. The only evidence, therefore, which could be obtained of the past existence of such fishes, would be afforded by their teeth; but these are wanting in the Lancelet and are very small in the Lampreys; so that we need not wonder that these fishes are unknown as fossils. The higher groups of Fishes, however, taking everything into consideration, may be said to be abundantly represented in a fossil condition by their scales, bones, teeth, and defensive spines.

The *Amphibians* are tolerably well represented by their bones and teeth, as well as by integumentary plates, and more especially by foot-prints. Most living Amphibians, however, spend their time mainly upon the land, or frequent fresh waters; and hence their remains would not be apt to be preserved in marine deposits.

The abundance of *Reptiles* as fossils naturally varies much, according to the habits of the different orders. Of the living orders, the *Chelonians* (Turtles and Tortoises) are by no means rare, since many of them are habitual denizens of the sea or of fresh waters, while they are provided with a hard integumentary skeleton. The snakes *(Ophidia)* are chiefly represented by marine forms, which frequented water. The Lizards *(Lacertilia)* live mainly upon land, and do not,

therefore, abound as fossils; but an extinct group (the *Mosasauroids*) was marine in its habits, and has consequently been pretty fully preserved. The *Crocodilia*, again, are so essentially aquatic in their habits, that their comparative frequency in aqueous deposits is no matter of wonder, especially if we recollect that many of the extinct members of the order seem to have frequented the sea itself. Of the extinct orders of Reptiles the great *Ichthyosauri*, and the *Plesiosauri* and their allies, were marine in their habits, and their remains occur in what may fairly be called profusion. The flying Reptiles or *Pterodactyles* would not seem to have any better chance of being preserved than birds, if as good; yet their remains occur by no means very rarely in certain formations. The terrestrial *Deinosaurs*, again, come very much under the laws which regulate the preservation of Mammals as fossils; and their remains are chiefly, but not exclusively, to be found in fluviatile deposits.

As regards *Birds*, their powers of flight, as pointed out by Sir Charles Lyell, would save them from many destructive agencies, and the lightness of their bones would favour the long floating of the body in water and thus increase the chances of its being devoured by predaceous animals. In accordance with these considerations, the most abundant remains of birds are referable to large wingless forms, to which the power of saving themselves from their enemies by flight was denied, whilst most of the bones were filled with marrow instead of air. Next after these come the remains of birds which frequent the sea-shore, lakes, estuaries, or rivers, or which delight in marshy situations.

As regards *Mammals*, the record is far from being a full one, and from obvious causes. The great majority of Mammals live on land, and, therefore, are not likely to be buried in aqueous and especially marine accumulations. That this cause is the chief one which has operated against the frequent preservation of Mammalian remains is shown by the fact that when we exhume an old land-surface amongst the later rocks, the remains of Mammals may be found in tolerable plenty. The strictly aquatic Mammals—Whales, Dolphins, and the like—are, of course, much more likely to have been preserved as fossils than the terrestrial forms; but their want of integumentary hard structures places them at a disadvantage in this respect, as compared with fishes. In a general way, we may conclude that the preservation of the terrestrial Mammals as fossils is due to the com-

paratively rare occurrence of a stray individual being killed whilst swimming a river or being mired in a bog; but there are other cases for which other explanations must be sought.

II. *Unrepresented Time*:—In the second place, I have had occasion to point out before that the *geological* record, or the series of the stratified deposits, is itself very imperfect; and this of necessity causes vast gaps in our palæontological knowledge. In this connection I may briefly review the evidence which we possess as to the immensity of the "unrepresented time" between some of our great formations; and I cannot do better than take the case of the Cretaceous and Eocene Rocks, though any other would do as well. In examining such a case, the evidence may be divided into two heads, the one palæontological, the other purely physical, and each may be considered separately.

The Chalk, as is well known, constitutes the highest member of the Cretaceous formation, and is the highest deposit known in Britain as appertaining to the great Secondary or Mesozoic Series. It is directly overlaid in various places by strata of Eocene age, which form the base of the great Tertiary or Kainozoic Series of rocks. The question, then, before us is this—What evidence have we as to the lapse of time represented merely by the dividing-line between the highest beds of the Chalk and the lowest beds of the Eocene?

Taking the palæontological evidence first, it is found that out of five hundred species of fossils known to occur in the Upper Cretaceous beds in England, only one *Brachiopod* and a few of the *Foraminifera* have hitherto been detected in the immediately overlying Eocene beds. These, on the contrary, are replete with fossils wholly distinct from the Cretaceous species. It may be said, therefore, that the entire and very extensive assemblage of animals which lived in the later Cretaceous seas of Britain had passed away and become extinct before a single grain of the Eocene Rocks had been deposited. Now, it is, of course, open to us to believe that the animals of the Chalk sea were suddenly extinguished by some natural agencies unknown to us, and that the animals of the Eocene sea had been as suddenly and in as obscure a manner introduced *en masse* into the same waters. This theory, however, calls upon the stage forces of which we know nothing, and is contradicted by the whole tenor of the operations which we see going on around us at

the present day. It is preferable, therefore, to believe that no such violent processes of destruction and re-peopling took place, but that the great and marked break in the life of the two periods indicates an enormous lapse of time. The Cretaceous animals, in consequence of the elevation of the British area at the close of the Cretaceous period, must have mostly migrated, some doubtless perishing, and others probably becoming modified in the process. When the British area became once more submerged beneath the sea and became again a fitting home for marine life, an immigration into it would set in from neighboring seas. By this time, however, the Cretaceous animals must have mainly died out or must have been greatly altered in characters; and the new immigrants would be forms characteristic of the Lower Eocene. How long the processes here described may have taken, it is utterly impossible to say, even approximately. Judging, however, from what we can observe at the present day, the palæontological break between the Chalk and the Eocene indicates a perfectly incalculable lapse of time; for all species change slowly, marine species especially so, and we have here the disappearance of a whole and entire fauna, and its replacement by another wholly distinct.

In the second place, to come to the physical evidence, the Eocene strata are seen to rest upon a denuded and eroded surface of Chalk, and to fill up "pipes" and winding hollows which descend far below its general surface. Not only so, but the base of the Eocene Rocks is commonly composed of a bed of rolled and rounded flints, derived from the Chalk, and affording unquestionable proof that the Chalk had been subjected to great denudation before the Eocene beds were deposited upon its surface. In short, the Eocene strata rest "unconformably" upon the Chalk; and this, as is well known, indicates the following sequence of phenomena:—Firstly, the beds of Chalk were deposited in a horizontal position at the bottom of the sea. Secondly, at some wholly indefinite time after its deposition, after it had become more or less consolidated, the Chalk must have been raised by a gradual process of elevation above the level of the sea, during which it must inevitably have suffered vast denudation. Thirdly, after another wholly indefinite interval, the Chalk was again submerged beneath the sea, in which process it would be subjected to still further denudation, and an approximately level surface would be formed upon it. Fourthly, strata of Eocene age were deposited

upon the denuded surface of the Chalk, filling up all the inequalities of its eroded surface.

Section, showing strata of Tertiary age (*a*) resting upon a worn and denuded surface of White Chalk, (*b*) the stratification of which is marked by lines of flints.

In the unconformability, then, between the Chalk and Eocene Rocks, we have unequivocal evidence—irrespective of anything that we learn from Palæontology—that the break between the two formations was one of enormous length. In Britain, the interval of time thus indicated is not represented by any deposits, and in Europe generally, there are but a few fragments of such. We may be quite sure, however, that during the time represented in Britain by the mere line of unconformability between the Chalk and the Eocene, there were somewhere deposited very considerable accumulations of sediment. Whether we shall ever succeed in discovering these, or any part of these, is, of course, uncertain. We may be certain, however, that such deposits, if ever discovered, will prove to be charged with the remains of animals intermediate in character between those of the Cretaceous and the Eocene period, and the large gap now existing between these formations will thus be more or less completely bridged over.

Amongst other well known instances of more or less general unconformity in the stratified series, may be mentioned that between the Lower and Upper Silurian (not always present), that between the Lower and Upper Old Red Sandstone (also not universal), that between the Carboniferous and Permian Rocks, that between the Permian and Triassic Rocks (not universal), and that between the Lower and Upper Cretaceous Rocks. All these physical breaks are accompanied by more or less extensive palæontological breaks as well. Other breaks which the absence of fossils renders less important, or

which are not thoroughly established, are those between the Lower and Upper Laurentian, the Upper Laurentian and Huronian, and the Upper Cambrian and Lower Silurian.

It may be well to point out that the unconformabilities here indicated must in no way be confounded with the common cases in which beds of one age rest unconformably upon beds far older than themselves. When, for example, we find beds of Carboniferous age resting unconformably upon Silurian Rocks, this merely indicates that in the particular locality under examination the Devonian or Old Red Sandstone is missing. This absence of a whole formation in any given region merely shows that the area was dry land during the period of that formation, or that, if any rocks of this age were ever deposited in this locality, they were removed by subsequent denudation. Here, however, we know what formation is wanting, and we can intercalate it from areas elsewhere, and thus complete the series. The case is very different in the instances above spoken of, as where the Permian Rocks rest unconformably upon the Carboniferous. Here, we have two successive formations in unconformable junction, and we are not acquainted with any intermediate group of strata which could be intercalated from any other locality.

From the above facts, then, we learn that one of the chief causes of the imperfection of the palæontological record is to be found in the vast spaces of time intervening between most of the great formations, not represented, so far as we yet know, by any formation of rock. In process of time we shall doubtless succeed in finding deposits for some of this unrepresented time; but much will ever remain for which we cannot hope to find the representative sediments. It only remains to add that we have ample evidence, within the limits of each formation, and wholly irrespective of any want of conformity, of such lengthened pauses in the work of deposition as to have allowed of great zoological changes in the interim, and to have thus caused irremediable blanks in the palæontological record. Thus, there are hundreds of instances in which the fauna of a given bed, perhaps but a few inches thick, differs altogether from that of the beds immediately above or below, and is characterized by species peculiar to itself. In such cases, we can only suppose that, though no physical break can be detected, the deposition of sediment was interrupted by pauses of incalculable length, during which no sediment was laid down, whilst time was allowed for the dying out of

old species, and the coming in of new ones. The incessant repetition of such intervals of unrepresented time throughout the whole stratified series is convincing proof that the palæontological record is, and ever will be, a most fragmentary collection of the remains of the animal life of the globe.

III. *Thinning out of Beds* :—Another cause by which the continuity of the palæontological record is affected is what is technically called the "thinning out" of beds. Owing to the mode in which sedimentary beds are produced, it is certain that there must be for every bed a point whence the largest amount of the sediment was derived, and in the neighborhood of which the bed will, therefore, be thickest. Thus if we take a series of beds such as sandstones and conglomerates, which are the products of littoral action, and are deposited in shallow water near a coast-line, it will be found that these gradually decrease in thickness or "thin out," as we pass away from the coast in the direction of deep water. On approaching deep water, however, we might find that though the sandstones were rapidly dying out, the thickness of the entire series might still be preserved, owing to the commencement now of some deep-water deposit, such as limestone. The beds of limestone would at first be

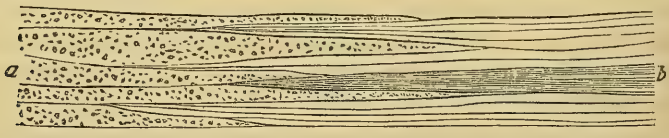

Diagram to show the "thinning out" of beds. *a*. Sandstones and Conglomerates. *b*. Limestones.

very thin, but in proceeding still in the direction of deeper and deeper water, we should find that they would gradually expand, till they reached a point of maximum thickness, on the other side of which they would again gradually thin out. Each individual bed, therefore, in any group of stratified rocks may be regarded as an unequal mass, thickest in the centre and gradually tapering off or "thinning out" in all directions towards the circumference.

In a general way, this holds good not only for any particular bed, but for any particular aggregation or group of beds which we may choose to take. In the case, namely, of every group of beds there must have been a particular point whither sediment was most abundantly brought, or where the other conditions of accumulation were especially favourable. At this point, therefore, the beds are thickest, and from

this they thin off in all directions. It need scarcely be pointed out, indeed, that some such state of things is absolutely unavoidable in the case of every bed or group of beds; since no sea is boundless, and the sedimentary deposits of every ocean must come to an end somewhere.

An excellent illustration of the phenomena above described may be derived from the Lower Carboniferous Rocks of Britain. Here we may start in the south of Wales and in Central England with the Carboniferous Limestone as a great calcareous mass over 1,000 feet thick, without almost a single intercalated layer of shale. Passing northwards, some of the strata of limestone begin to thin out, and their place is taken by beds of a different mineral nature, such as sandstone, grit or shale. The result of this is that by the time we have followed the Carboniferous Limestone into Yorkshire and Westmoreland, in place of a single great mass of limestone we have now an equivalent mass composed of alternating strata of limestone, sandstone, grit and shale, with two or three thin seams of coal, the limestones, however, still bearing a considerable proportion to the whole. The limestones, however, continue to thin out as we pass northwards, till in Central Scotland, in place of the dense calcareous accumulations of Derbyshire, the Lower Carboniferous series consists of a great group of sandstones, grits, and shales, with thick workable beds of coal, and with but few and comparatively insignificant beds of limestone.

The state of things indicated by these phenomena is as follows:— The sea in which the Lower Carboniferous Rocks of Britain were deposited, must have gradually deepened from North to South. The land and coast-line, whence the coarser mechanical sediments were derived, must have been placed somewhere to the north of Scotland, and the deepest part of the ocean must have been somewhere in the latitude of Derbyshire and South Wales. Here the conditions for lime-making were most favourable, and here, consequently, we find the greatest thickness of calcareous strata and the smallest intermixture of mechanical deposits.

The palæontological results of this are readily deducible. The entire Lower Carboniferous series of Britain was deposited in a single ocean, apparently destitute of land-barriers, and consequently, taken as a whole, the fauna of this series may be regarded as one and indivisible. The conditions, nevertheless, which obtained in different

parts of this area were very different, and, as a necessary result, certain groups of animals flourished in certain localities, and were absent or but scantily represented in other places. In the deeper parts of the area, we have an abundance of corals, with Crinoids, and at times *Foraminifera*. In the shallower parts of the area there is, on the other hand, a predominance of forms which affect shallow water. Still, there is no difference in point of time between the deposits of different parts of the area, and in order to obtain a true notion of the Lower Carboniferous fauna, we must add the fossils derived from one portion of the area to those obtained from another.

In many cases, however, we are acquainted with but one class of deposits belonging to a given period. We may only have the deep-sea deposits of the period, or we may know nothing but its littoral accumulations. In either case it is clear that there is an imperfection of the palæontological record; for we can not have even a moderately complete record of the marine animals alone of a particular period, unless we have access to a complete series of the deposits laid down in that period.

IV. *Sudden extinction of Animals:* — While there can be little doubt but that the changes in animal life indicated by geology were gradually effected, there still remain cases in which individuals seem to have been suddenly destroyed, and others of a more obscure nature in which allied species succeed one another with an inexplicable rapidity. As an example of the first class of cases we may take the great marine Reptiles of the Lias, which often exhibit indications of having met a sudden death, while they show no marks of mechanical injury. It has been suggested by Sir Charles Lyell, with great probability, that the sudden death of marine animals, as in these and similar cases, might be due to the sudden "periodical discharge of large bodies of turbid fresh water into the sea."

As an example of the second class of cases, we may take the existence in the Lias of zones characterized by particular species of Ammonites. These zones are usually of small thickness, and the Ammonite characterising each is usually confined to that particular horizon; whilst several of the zones have been found to be persistent over very large areas. As we know of no reason why one species of Ammonite should flourish where another allied species would not, we can not at present account for this sudden disappearance of one species and its seeming immediate replacement by another.

V. *Disappearance of Fossils:* — The last subject which need be mentioned in connection with the imperfection of the palæontological record, is the subject of the disappearance of fossils from rocks originally fossiliferous. This, as a rule, is due to "metamorphism;" that is to say, the subjection of the rock to an amount of heat sufficient to cause a re-arrangement of its particles. When of at all a pronounced character, the result of metamorphism is invariably the obliteration of any fossils which might have formerly existed in the rock. To this cause must be set down many great gaps in the palæontological record and the loss of much valuable fossil evidence. The most striking example which can be given of this is to be found in the great Laurentian Series, which comprises some 30,000 feet of highly-metamorphosed sediments, but which, with one not absolutely certain exception, has as yet yielded no remains of life, though there is strong evidence of the former existence in it of fossils.

Another not uncommon cause of the disappearance of fossils from originally fossiliferous deposits is the percolation through them of water holding Carbonic Acid in solution. By this means, fossils of a calcareous nature are dissolved out of the rock, and may leave no traces behind. This cause, however, can only operate in loose and porous arenaceous deposits.

Lastly, cleavage may be mentioned as a cause of the disappearance of fossils. The cleavage, however, must be very intense, if it actually prevents the recognition of the fossiliferous nature of deposit; though cases are not uncommon in which this occurs through thousands of feet of strata. As a more general rule, however, it is not very difficult to determine whether a cleaved rock has ever contained fossils or not, though it may be quite impossible to make out the exact nature and character of the organic remains.

THE AUTHENTICITY OF THE POEMS OF OSSIAN.

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When in the eighteenth century the poems of Ossian were published by James MacPherson, great surprise was felt that poems purporting to belong to a very remote age, could have been transmitted mainly by oral tradition. Many wondered that poems, ostensibly the production of a very rude and early age, could contain ideas so grand and sentiments so refined and elegant as the poems of Ossian undoubtedly possess. It was in literary circles deemed necessary to subject these writings to a very rigid examination. That poems of acknowledged beauty could remain so long in obscurity; that they could have floated in comparative safety across many centuries; that in a country greatly removed from the influence of classical learning, sentiments similar to those which pervade the writings of Ossian could be cherished; that suddenly from a comparatively unknown portion of Scotland there issued poems which speedily made a great impression in the literary world,—was sufficient to draw the critical attention of many. There were not wanting those who maintained that it was impossible for poems to be handed down during many centuries mainly by oral tradition. The beauties pervading the poems of Ossian soon made a marked impression in learned circles; and hence arose the eagerness wherewith men like Johnson, Hume and Laing, endeavoured to prove that the poetical writings in question were the composition of MacPherson himself. Occupying, as these men did, a very distinguished place among the learned of that age, it is not wonderful that their efforts to overthrow the authenticity of Ossian, induced others to regard the entire poems as a forgery and as the production of MacPherson himself. It was to be expected that the opinions of writers who in all likelihood bestowed some attention on the vexed question of the genuineness of the poems ascribed to

Ossian, would continue to influence others who did not choose to investigate the matter for themselves. Whatever opinion may finally prevail regarding the poems of Ossian, it must be confessed that great injustice has been done to them, because all the facts connected with their history have not been carefully examined. It seems almost superfluous, at this distance of time, to refer to a subject in which, it may be supposed, few now feel any interest. It will not, however, be without some avail to examine concisely the entire controversy respecting the poems of Ossian. It will be found that sufficient evidence remains for overthrowing the objections of Johnson and Laing, and for gaining some measure at least of reputation for the Bard of Selma. It will be seen that the hoar of centuries lends additional weight to the poems of Ossian. There are strong arguments to show that the heroes whose names appear in these poems were well known long before MacPherson's translation appeared. Throughout the Highlands of Scotland, there is abundant testimony in favour of the general opinion which is held in reference to the Fingalians. In the names of places, in popular traditions, in the corroboration which archæological researches furnish, in the veneration which still attaches to the poems of Ossian and to the affecting incidents which they describe, there is enough to justify the inference that at some remote time such heroes must have lived and flourished.

Long before MacPherson undertook the publication of the poems of Ossian, the attention of Home, Jefferson, Blair and others was directed to the fact that throughout the Highlands of Scotland poems of very great antiquity were in circulation. It was likewise asserted that unless some means were used to put these poems into a permanent form, they would soon be lost to the literary world. In the early part of the eighteenth century, political agencies were at work which greatly changed the social life of the Highlands, and threatened to overthrow those means whereby poems were handed down from one generation to another. With the view, therefore, of preserving poems which, to say the least of it, were interesting on account of the language they represented, and the very remote origin to which they lay claim, Home, Jefferson, Robertson and Blair induced James MacPherson, a native of Badenoch, to undertake a journey through the Highlands, in order to recover as many as possible of the poems of Ossian. It was in 1760 that MacPherson, thus aided, undertook to collect poems which had been handed down by oral tradition or in

manuscript from a very early age. He was successful in collecting many poems which were perpetuated by oral tradition. He came in contact with many who, though unable to read, could recite with ease poems of great length. He published from time to time translations of those poems which he was successful in procuring. The admiring attention of very many readers was drawn to the beauties contained in his translations. Blair warmly espoused MacPherson's cause. In his well known Dissertation on the Poems of Ossian, Blair pointed out the peculiar beauties of these writings, drew a very favourable comparison between Homer and Ossian, and sought to prove by internal evidence that the Bard of Selma lived in the early part of the third century. Every unprejudiced reader of the evidence which has come down to us must concede that MacPherson did injury to his own cause by his unguarded language and the stubborn opposition which he manifested. In writing to Blair, Hume remarks, with reference to MacPherson: "But you must not mind so strange and heteroclite a mortal, than whom I have scarce ever known a man more perverse and unamiable." All who are disposed to think kindly and favourably of MacPherson must regret that he did not choose to show more deference to the inquiries of those who wished to obtain stronger confirmation of the genuineness of the poems of Ossian.

There are many witnesses who attest, that the names of Fingal and his heroes were known beyond the Highlands of Scotland long before MacPherson published his Translation of Ossian.

Barbour in his Bruce thus clearly refers to Fingal: (1489)

> "He said, methink Marthoky's son,
> Right as Gol MakMorn was won,
> To haiff fra Fingal his menyie,
> Rycht swa all hys fra us has he."

In Kirk's Edition of the Psalms of David, published in 1684, this very distinct allusion is made to Fingal in the author's address to his book:

> "Hail the generous land of Fingal's heroes,
> The Highland tracts and isles of Hebrides."

In a book published by Bishop Carswell of Argyle, in 1567, he thus speaks in his preface: "Though we have some accounts of the Gaeil of Scotland and Ireland contained in manuscripts, and in the genealogies of bards and historiographers, * * they are more desirous

to compose * * histories concerning warriors and champions and Fingal the son of Cumhall with his heroes."

Dunbar likewise makes reference to Fyn Makowll and Goro MacMorn.

The Dean of Lismore's Book contains a strong refutation of the objections which have been raised against Ossian. The contents of this book were published in 1861. The poems contained in it were gathered by James MacGregor, Dean of Lismore, who died about the year 1551. This book is, therefore, more than three hundred years old; and a great portion of it may be assigned to as early a date as 1512. It contains twenty-eight Ossianic poems, extending to two thousand five hundred lines. It is now in the Advocate's Library, Edinburgh. It was deciphered by the Rev. Dr. MacLauchlin. In the interesting preface which he prepared, Mr. Skene remarks: "The Dean's MS. has a double value, philological and literary, and is calculated to throw light both on the language and the literature of the Highlands of Scotland. It has a philological value, because its peculiar orthography presents the language at the time in its aspect and character as a spoken language, and enables us to ascertain whether many of the peculiarities which now distinguish it were in existence three hundred years ago; and it has a literary value, because it contains poems attributed to Ossian, and to other poets prior to the sixteenth century, which are not to be found elsewhere; and thus presents to us specimens of the traditional poetry current in the Highlands prior to that period, which are above suspicion, having been collected upwards of three hundred years ago, and before any controversy on the subject had arisen."* It thus appears, that apart from the evidence furnished by MacPherson, other writers place the existence of poems belonging to the age of Ossian beyond a doubt.

It is perhaps difficult now to form an estimate of the retentiveness which, under particular cultivation, the memory is capable of acquiring. Classical writers relate how, in a manner which to us seems almost incredible, the memory has been known to possess an amazing power. We learn from Cæsar that the Druids of Britain obtained marvellous success in this respect. Owing to causes which to themselves were of great consequence, they preferred this very diligent exercise of the memory. The language of Cæsar not only indicates

* Dean of Lismore's book, p. 11.

that oral tradition was largely cultivated in Britain: it also enables us to see in what manner poems of considerable length could be transmitted with tolerable accuracy. "Disciplina in Britannia reperta: atque inde in Galliam translata esse, existimatur; et nunc, qui diligentius eam rem cognoscere volunt, plerumque illo, discendi causa, profiscuntur. * * Tantis excitati praemiis, et sua sponte multi in disciplinam conveniunt, et a parentibus propinquisque mittuntur. Magnum ibi numerum versuum ediscere dicuntur. Itaque annos nonnulli vicenos in disciplina permanent. * * Id mihi duabus de causis instituisse videntur: quod neque in vulgum disciplinam efferri velint, neque eos, qui discant, literis confisos, minus memoriae studere: quod fere plerisque accidit, ut praesidio literarum, diligentiam in perdiscendo, ac memoriam remittant."* In his Greek Classical Literature (p. 60), Brown thus remarks: "Accustomed as we are to all that assistance to literary composition which the art of writing supplies, and, what is still more important, to the substitute for memory itself, which the power of committing our thoughts to paper furnishes, it is scarcely possible to form any idea of the natural powers of the memory when obliged to depend on its own resources. * * It is not, therefore, so impossible a thing as it may at first sight appear, to conceive a poem of many thousand lines composed and arranged as a perfect whole, by an effort of memory, and then so perfectly retained in the mind as to be capable of recitation. Instances are not unknown of the wonderful power of memory when it is compelled to exert itself. Plutarch mentions the astonishing memories which the Greeks possessed." In the preface to MacCallum's Ossian (p. 17), the following very judicious remarks are made regarding the poems of Ossian: "With regard to the manner in which the originals of these poems have been preserved and transmitted, which has been represented as mysterious and inexplicable, we have the following plain but satisfactory account: that until the present century, almost every great family in the Highlands had its bard, to whose office it belonged to be master of all the poems of reputation in the country; that among these poems, the works of Ossian are easily distinguished from those of later bards, by several peculiarities in the style and manner; that Ossian has always been reputed the Homer of the Highlands, and all his compositions held in singular esteem and veneration; that it

* De Bello Gallico: Lib. 6; 13, 14.

was wont to be the great entertainment of the Highlanders, to pass the winter evenings in discoursing of the times of Fingal, and rehearsing these old poems of which they have all along been enthusiastically fond; that when assembled at their festivals, or any public occasions, wagers were often laid who could repeat most of them; and to have store of them in their memory, was both an honourable and a profitable acquisition, as it procured them access to the families of great men; that with regard to their antiquity, they are beyond all memory or tradition, in so much that there is a phrase commonly used in the Highlands to this day, when they would express any thing which is of the most remote or unknown antiquity, importing that "it belongs to the age of Fingal." I have the pleasure of knowing a gentleman in Argyleshire, Scotland, who can recite Gaelic or Ossianic poems of great length, which, so far as I know, have not yet been published. He has repeatedly mentioned to me that it was customary in his early days for Highland families to spend the long winter evenings in listening to those who could recite poems having reference to the times of Ossian. He has often expressed a regret that, through inattention, he has allowed many of the poems he heard in his youth to pass into forgetfulness. In addition to the evidence we possess in favour of the great attention which was paid to the recital of poems among the ancient Highlanders, it should be remembered that, while intellectual darkness prevailed in many countries, there was a large measure of enlightenment in the Highlands of Scotland. It is well known that from Iona men went forth who carried rays of light into distant countries and sowed there the seeds of moral and spiritual knowledge. May it not with safety be supposed, that the industrious monks of Iona turned their attention to the poems of Ossian and committed them to writing? Certain it is that MSS. existed, containing Ossianic poems. Some of these were recovered after MacPherson published his Translation of Ossian. It was clearly proved that many MSS. were lost or destroyed during the political troubles which swept over the Highlands in the early part of the last century. Many trustworthy men affirmed that, if an effort had been made at an earlier date to procure MSS., many could be found throughout the Highlands. Had sufficient attention been given to the power which oral tradition had among the Highland bards, and to the Gaelic MSS. which existed, less bitterness would have been manifested towards MacPherson and

greater justice would have been done to the venerable bard of Selma.

It was in 1773 that Johnson paid his well-known visit to the Hebrides. Any candid reader of his "Tour in the Hebrides" will admit, that he spoke very disparagingly of the civilization of the Highlands. His narrative indicates that he was prejudiced, and therefore unfitted for acting the part of an impartial critic. At any rate, his stay was of very short duration, and the knowledge which he could gather must have been very inaccurate. "Of the Gaelic language," he says, "as I understood nothing, I cannot say more than I have been told: it is the rude speech of a barbarous people, who had few thoughts to express, and were content, as they conceived grossly, to be grossly understood. Five hundred lines cannot be recovered in the whole Erse language of which there is any evidence that they are a hundred years old. They, i.e., the inhabitants of the Highlands, have enquired and considered little, and do not always feel their ignorance. They are not much accustomed to be interrogated by others, and seem never to have thought upon interrogating themselves; so that if they do not know what they tell to be true, they likely do not perceive it to be false." For the hospitality with which he was treated by the Highland lairds and ministers, Johnson made a very sorry requital. The Dean of Lismore's Book, to which reference has been already made, clearly refutes the objection that no poem existed which was a hundred years old. The disparaging remarks of Johnson respecting the ignorance and untruthfulness of the Highlanders could proceed only from strong dislike and preconceived opinions. I have heard a gentleman recite a Gaelic poem in which Johnson is ridiculed in very severe terms. Though this satire is couched in very elegant language, I have never been able to see it in print. Owing, however, to the lofty position occupied by Johnson in the literary world, his very unfavourable deliverance could not fail to have an injurious effect on the poems of Ossian.

Laing, the historian, was also a determined opponent of the poems of Ossian. He accused MacPherson of plagiarism, and had recourse to very ingenious arguments to make this accusation valid. He took unwarrantable advantage of certain concessions made by MacPherson. "MacPherson," he says, "has acknowledged from the beginning the deceit. 'It would be a very uncommon example of self-denial in me to disown them, were they really of my composition.'" The plau-

sible manner in which Laing proceeded to account for the origin of the various poems ascribed to Ossian, was calculated to do immense injury to MacPherson. The reader has reason to suppose that the poems bearing the name of Ossian are forgeries, and that Laing was by some means acquainted with the manner in which MacPherson prepared them. Laing's reading must have been very extensive; and hence it is that with wonderful assurance he sought to account for the origin of the several poems which bear the name of Ossian. So unqualified are his opinions and so confident is his judgment, that the reader may be pardoned for imagining that Laing himself acted a prominent part in the fabrication of those poems which he ascribes to MacPherson. According to him, Milton, Virgil, Pope, and the Holy Scriptures furnished MacPherson with his most pleasing ideas and comparisons. He must have forgotten that no poems are truer to nature than the poems of Ossian. The ideas of the poet were very circumscribed indeed. Nature in her manifold phases: sun, moon and stars; the roaring streams and loud blasts of winter; the towering trees and solitary moss-covered rocks—furnished the grandest ideas which are found in the poems of Ossian. There is in them an absence of everything that would betray any great advancement in enlightenment and civilization, or any acquaintance with the literature and customs of other countries. It is surely not too much to expect that the many observers of nature's beauties can, irrespective of mutual aid, discover her most pleasing as well as her most melancholy features. May it not be asked, Why could not Ossian and MacPherson discover for themselves those beautiful comparisons which nature offers to every attentive observer? Laing further affirms that, because MacPherson knew nothing about the religion which prevailed in Scotland in the era he assigns to Ossian, he studiously avoided every reference to the religious opinions of that time. Led away by the English version of certain Gaelic words, Laing sought to detect anachronisms in the writings of Ossian. Tura's wall, to which allusion is made in Fingal, was in his opinion open to the objection, that towers or castles were not erected in Ireland for nine centuries subsequent to the date assigned by MacPherson to Ossian. Laing could not have known that in Gaelic no word is commoner or more ancient than *tùr*, the equivalent of tower. It means a heap of stones, however rudely and irregularly they may be arranged. With regard to the objection that no pointed

reference is made to the religious belief of the age in which Ossian is supposed to have lived, it is enough to mention that the Gaelic bards formed a distinct class from the Druids to whom the concerns of religion were committed. "Illi rebus divinis intersunt, sacrificia publica ac privata procurant, religiones interpretantur."* The poems of Ossian, it is true, present a very rude belief. The heroes in their airy halls are supposed to follow those avocations which were dear to them on earth. "They pursue boars of mist along the edge of the clouds."

There are still stronger grounds for overthrowing the opinions advanced by Johnson, Laing, and perhaps by Hume, respecting the poems of Ossian. In deference to the many objections which were raised against the genuineness of these poems, the Highland Society submitted a series of questions to clergymen and others, who resided in the Highlands of Scotland. The object of these questions was, to ascertain whether poems similar to those collected and published by MacPherson existed in the Highlands and were available. Minute inquiry was made as to whether the poems published by MacPherson could be identified with the poems which were still in circulation. The report of the Highland Society was published in 1806. By unassailable evidence it was shown that the history of Fingal and his followers, of Ossian and his poems, was commonly known; that poems similar to those which were published by MacPherson existed in many parts of the country, and could be recited by men who had never heard of MacPherson. Regarding the prevalence of Ossianic poetry in the Highlands, the report terminates with this decided language: "The committee can with confidence state its opinion, that such poetry did exist; that it was common, general, and in great abundance; that it was of a most impressive and striking sort, in a high degree eloquent, tender and sublime." † The following citations from the letters addressed to the committee are very explicit: "Before MacPherson could know his right hand from his left, I have heard fragments of them repeated, and many of those fragments I recognized in Mr. MacPherson's translation." ‡ "There are many poems ascribed to Ossian more than Mr. MacPherson has translated; many of which, I dare say, he never heard, and of these not a few, in my humble opinion, of as

* De Bello Gallico. Lib. 6, 13.

† Highland Society's Report on Ossian, p. 151; and *ibid*, p. 39.

‡ Highland Society's Report on Ossian, p. 151; and *ibid*, p. 39.

much poetical merit as any he has inserted. MacPherson took too little time in the Highlands and Western Isles, to be able to have collected the whole of them; for as the works of Ossian are dispersed all over the Highlands, there is not a clan through whose land you travel, but you will find some one of these poems among them, which is not to be met with any where else." *

The report of the Highland Society has forever rescued Ossian's poems from the imputation of being a forgery. MacPherson took down some of the poems which he published from the recitation of men with whom he came in contact in his tour through the Highlands. He was also indebted to MSS. for some of the poems. "From this man the declarant got for MacPherson a book of the size of the New Testament, and of the nature of a commonplace book, which contained some accounts of the families of the Macdonalds, and the exploits of the great Montrose, together with some of the poems of Ossian." * In writing to a friend, MacPherson remarks: "I have met with a number of old MSS. in my travels; the poetical parts of them I have endeavoured to secure." †

It is perhaps impossible to determine how far MacPherson was led to arrange the poems which he collected. In all likelihood he used his own discretion in selecting such portions as he might deem most suitable and authentic. Apart from the overwhelming evidence gathered by the committee of the Highland Society, there are very cogent reasons for believing that MacPherson was incapable of writing Gaelic so pure and elegant. I have never observed that proper attention has been paid by any one to the language of the poems of Ossian. It is undoubtedly the classical Gaelic of the Highlands. For purity and beauty, for richness and expressiveness, it stands alone in the whole range of Gaelic literature. There is no poet of the eighteenth century, whose Gaelic at all approaches the rich, terse and elegant diction of Ossian. In his poems there is no reference whatever made to agriculture: the chase afforded to the heroes of Fingal their most pleasing employment. The sails are held together by thongs. Battles are often determined by single combat. It is very much to be questioned whether any one who wished to forge poems to which a very remote origin was to be assigned, could so divest himself of modern ideas and habits as not to make an occasional

* Report, p. 28, Appendix.
† *Ibid*, Appendix, p. 96; and *ibid.* p. 154.

betrayal of his dishonesty. Dr. Blair, who knew MacPherson well, thus speaks of him: "Of all the men I ever knew, MacPherson was the most unlikely and unfit to contrive and carry on such an imposture as some people in England ascribed to him. He had none of the versatility, the art and dissimulation, which such a character and such an undertaking would have required." * One of MacPherson's coadjutors in the arranging of Ossian's poems remarks: "He could as well compose the prophecies of Isaiah, or create the Island of Skye, as compose a poem like one of Ossian's." There is a well authenticated story, which in itself goes far to show that MacPherson was unable to compose the poems which he translated. Having landed on one of the Hebrides, he submitted this very ambiguous question to one who chanced to be a poet of no common excellence: "*Am bheil dad agad air an Fheinn?*" MacPherson intended to ask the question as to whether his friend had any information respecting the Fingalians. This inquiry, when strictly interpreted, means, whether the Fingalians were in any way pecuniarily indebted to him of whom the question was asked. It may be stated that no one possessing an accurate knowledge of Gaelic would ever use so ambiguous an interrogation. No further evidence is needed to show that MacPherson did not and could not forge the poems which he translated. It cannot be maintained that his rendering is always accurate. He frequently misunderstood the meaning of the original. Still, in spite of every shortcoming, his translation is so elegant and attractive as to merit the commendation of Dr. Blair: "I confess I cannot avoid considering the discovery of the works of Ossian as an important era in the annals of taste and literature; and the share which I have had in contributing towards it, as a part of my life, by which I have deserved well both of this age and posterity."

* Report, Appendix, p. 60; and *ibid*, p. 177.

THE COPTIC ELEMENT.

IN LANGUAGES OF THE INDO-EUROPEAN FAMILY.

BY THE REV. JOHN CAMPBELL, M.A., TORONTO.

Read before the Canadian, Institute, February 10th, 1872.

(Continued from page 303.)

While the title of this paper is "The Coptic element in Languages of the *Indo-European* Family," I may be permitted to indicate the presence of the same element in other families of language. Allusion has already been made to the claims of the African and Polynesian languages to relationship with the Aryan and Semitic tongues. After a survey of vocabularies of over two hundred different languages spoken in all parts of the world, it is only among these two groups and, to a very slight extent, among the monosyllabic tongues of eastern Asia, that I have so far been able to discover the presence of that initial *p* sound which I have identified with the Coptic article. One of the simplest examples is to be found among certain of the numerals of ten African languages, most of which belong to the West Coast.[42]

LANGUAGE.	TWO.	FOUR.	FIVE.
Buntakoos of Guinea	*noo*	nah	taw.
Igberra on Niger River	ebba	enna	*jokki.*
Ratongga on Bagoon River	beba	binni	betta.
Bight of Benin	bi	nin	tang.
Efik of Calabar	iba	inang	itiun.
Otam on Cross River	beba	bini	bittan.
Mandinga	*fula*	nani	*lulu.*
Mozambique	*pili*	*ssesse*	thana.
Lagoa Bay	*see-berry*	nau	thanou.
Bongo on Gaboon River	baba	banai	batan.

In the Ratongga, the Otam and the Bongo languages we find the African representatives of the Æolic, Sabine and High German of Europe. Among Asiatic tongues, in what is generally called the Monosyllabic area, the Japanese holds most strongly to the Coptic

[42] Bowring, Decimal System. London, 1854; p. 165—168.

An Account of Timbuctoo and Housa, &c., by El Hage Abd. Salam Shabeeny, with notes by J. G. Jackson, London, 1820: p. 373.

Twenty-nine years in the West Indies, &c., by Waddell. Appendix vi.

The words in italics in this and subsequent lists are abnormal forms that do not form part of the comparison.

form. This may be seen by a comparison of certain words in that language with corresponding ones in that of Loo-Choo.[43]

English:	*bridge*	*quick*	*pencil*	*nose*	*ship*	*umbrella*	*navel.*
Loo-Choo:	hashee	hayee	hoodee	honna	hoonee	shassee	whoosoo.
Japanese:	fas, bas	faijo	fuda	fanna	fune	fisasi	fosso, feso.

It is not to be supposed that the difference between these two languages arises from the inability of the people of Loo-Choo to pronounce the letters *p*, *b* and *f*. Both in Japan and Loo-Choo the word for fire is *fe*, for flower, *fanna*, and for star, *fosi* or *fooshee*. In the word denoting *sail* the languages seem to change places, for in Loo-Choo it is *foo* and in Japanese *hoo*. Still more striking is the fact that the Japanese *yak*, meaning *hundred*, is replaced in the dialects of Canton and other parts of the Chinese Empire by *pak*.

The Polynesian languages might afford us many examples of the use of the prefix now under consideration, like the word for *hair*, which, among the Friendly or Tonga Islanders, has the two forms *ooloo* and *fooloo*. I shall confine myself, however, as in the case of the African languages, to an illustration from the Malay numerals. These numerals present many interesting points of connection with those of the Indo-European languages. Thus, *three* is *toru*; *two* is *duo*, and when *one* has not the form of *isa*, *sye*, *essa*, approaching the Greek *heis*, it assumes that of *satoo*, *aida*, *ida*, *taha*, which is not unlike either the Syriac and Chaldee HHAD, the Hebrew ECHAD, the Arabic AHAD or WAHAD, or the Sclavonic *Odin*, *Ieden*. The following are the numerals *seven* and *eight* in fifteen different languages of Polynesia.

Language.	Seven.	Eight.
Raratonga	itu	vara.
Otaheite	heitoo	warroo.
Easter I.	hiddoo	varoo.
N. Zealand.	weddoo	warroo.
Buges	pitu	aruwa.
Madagascar	heitoo	balloo.
Batta	paitoo	ooaloa.
Mangavai	pitu	alo.
Tonga	fitoo	valoo.
Tuham	fiti	gualu.
Phillippine	pito	valo.
Java	petu	wolo.
N. Guinea	fita	wala.
Samoa	fitu	valu.
Fiji	pitu	walu.

To these may be added five more irregular forms.

Language.	*Paumotua.*	*Sava.*	*Rotti.*	*Marquesas.*	*Sandwich.*
Seven:	hito	hetu	petu	hitu	*hiku.*
Eight:	*hawa*	*panu*	*tolu*	*vau*	valu.

[43] Account of a Voyage of Discovery to the West Coast of Corea, and the Great Loo-Choo Island, by Captain Basil Hall, F.R.S., &c Vocabulary by Lieutenant Clifford. London, 1818.

A mere glance at the nature of the differences between the words given above will suffice to show that physical conformation has nothing, or at least little, to do with them, inasmuch as peoples who reject the *b*, *p*, *f* or *v* in one case, keep it in the other. A survey of the whole vocabulary of numerals tends to confirm this view. The forms of the numeral *ten* may illustrate. In these, as in the forms of eight, and as in the Coptic language to a very great extent, we find the letters *l* and *r* interchanged.

Earatonga .....*n*auru.	*Tonga* .....ooloo *or ongo* fooloo.
Otaheite .....*a*-hooro.	*Tuham* .....*manud.*
Easter Island.....*ana*-hooroo.	*Sava*.....*bo.*
New Zealand .....*anga*-horro.	*Sandwich* .....*umi.*
Buges .....*so*puloh.	*Philippine* .....*a*palo.
Paomotua.....*hori*-hori	*Java* ....*sa*poulo.
Marquesas .....*ono*-huu.	*New Guinea* .....*sanga*-foula.
Madagascar .....fooloo.	*Samoa* .....*tini.*
Batta .....*sa*-pooloo.	*Fiji*.....*na*fulu.
Mangavai .....puluh.	*Rotti*. .....hulu.[44]

In this place I may also be permitted to allude to other forms of the article, which have been so bound up with the substantive before which they stand, or with the root to which their prefix gives a substantive power, that they have been mistaken for part of the root itself; and thus the etymology of the words of which they form part has been lost. The feminine form of the Coptic article in *T* or *Th*, which is supposed to have converted APE, *the head*, into TAPE or THEBE, has, doubtless, some connection with the Hebrew feminine termination, consisting of the same letter, or ת. Disregarding, however, its feminine character, it would be the same as the Hebrew ת (*t* or *th*) abbreviated from את, the mark of the accusative and a kind of article, which, prefixed to a verbal root, converts it into a noun, *e.g.* LAMAD, learn; TALMID, a learner. The language of Lybia, or of the Shelluhs, differs from that of the Canary Islanders in many words by the possession of this prefix. Thus, temples in Canarese are *almogaren*, and in Shelluh, *talmogaren*; a coarse article of dress, called the *haik*, is, in the former, *ahico*, and in the latter, *tahayk*.[45] I do not imagine that every *T* or *Th* which can be shown to be a prefix to the root, is a relic of an old article. In Hebrew,

[44] Mariner's Tonga Islands, by Dr. Martin. Edinburgh, 1827. Vocabulary. Labillardière's Account of a Voyage in Search of La Perouse. Translated. London, 1800. Vocabulary. Bowring's Decimal System, 160—163.

[45] Shabeeny's Timbuctoo, by Jackson; Languages of Africa, 355—381.

we have it as a distinguishing mark of certain persons of the future of the verb. What it stands for in our English *drop*, as compared with the Hebrew ARAPH, and RAAPH both meaning the same, I cannot tell. Still, in a very large number of cases, I believe that we shall find initial *t* performing the same office as initial *p*. There, is however, this difference between them. While *p*, as a form of the article, is banished from civilized languages, *t* remains. The Hebrew ETH represents the Dutch *het*, our English *the*, the German *die*, the Greek *to*, the Sanskrit *tat* and *etat*. The Hebrew demonstrative EL, and the Arabic article AL or EL, furnish the Latin *ille*, and the articles of the Romance languages. The true Hebrew article HA may not only be intimately related to the Greek *ho*, *he*, but also to the Sanskrit *sah*, the Hindustani *yih*, the Welsh *y*, and the Malay *he*.[46] Still another form of the article is the Cushite *ka* or *kai*, which is connected with the Sanskrit numeral *eka*, one, the Hindustani *ek*, *koi*, and the Malay *coe*, which, on account of its association with *he*, must, I think, have arisen from an aspirated pronunciation of the latter. The old Persian names Kai Kous, Kai Kobad, Kai Khosrou, although the *kai* is generally supposed to mean king, when compared with the Greek words *Kakos*, *Aiguptos*, *Kaisar*, seem to afford nothing more in the prefix than a form of the article. The same is seen in the two Arabic words for heart, the one being LEB, identical with the Hebrew, and the other KULB, both of which are adopted into the Persian language. It also appears in the Maori *Kapura*, as compared with the Tahitian *pura*, fire; and in the Easter Island *ko-tahai*, one, as compared with the Maori *tahai*. A connection of the Semitic and European languages being allowed, a very common substantive prefix in Hebrew, that of the letter מ or M, must not be lost sight of, although it has nothing to do with the article; MAGEN, a *shield*, from the verb GANAN, *guard*, *protect*, MERKHAB, a carriage or chariot, from the verbal root RAKHAB, *ride*, and MAGHREB or MAARAB, the *west*, from ARAB, (*Arab.* GHEREB,) *become dark*, are illustrative examples.

Among the various forms of the article mentioned above, that which occupies the place in comparative philology next in importance to the Coptic in P is the Arabic in AL or L. Every student is familiar with this part of speech from its frequent occurrence in the vocabularies of all civilized languages, testifying to the influence

[46] *Vide* Benfey, Die Agyptische Sprache, § 2.

exerted in Europe by Arabian culture during the palmy days of Mahommedanism. Few, however, have recognized the fact that the AL of Alexander is as truly Arab as the AL of Alkoran, or known that the oriental form of this name is SECANDER or ISCANDER. The province of Hejer or Bahrein in Eastern Arabia on the Persian Gulf is also called LAHSA, a word consisting of the common geographical name AHSA and the article EL, and from which Ptolemy called its inhabitants *Iolisitae*.[47] A precisely similar case is that of the old Pelasgian word *Larissa*, which is found in Syria, Assyria, and the south of Palestine. In every case the initial L is a remnant of the Arabic article, as appears most plainly in the Larissa that marks the boundary between Palestine and Egypt, which is a Greek form of EL ARISH.[48] The ancient Issa in the Adriatic becomes the modern Lissa by an inversion of the process. Hitzig connects the Philistine town Jamnia, partly on the authority of Stephanus of Byzantium, with the Greek *eiamenē*, and the latter word with *leimōn*, *limnē*.[49] That he is right in his last connection none can doubt, the difference between the words connected being simply the Arabic article. I am also prepared to say that he is right in his first connection, and that, pushing it a little farther, he might have arrived at an ancient abode of the Minyans and a prototype of Lemnos as well. Similar pairs of words are Academus and Lacedaemon, Esbus and Lesbos, the Russian province of Astrachan on the Caspian, the Indian Satrugna, brother of Rama, and the Laestrygones of the Homeric story. As a confirmation of the connection between Esbus and Lesbos it is worthy of note that the town Madmannah or Madmen of Moab, which lay near to the former, gave its name to Methymna, one of the chief towns of the latter. Antiphates, king of the Laestrygones, refers us not only to Amphiaraus, grandson of an Antiphates, with whom the Arab Moafer connects, but also to an Alcmaeon line reproducing the Lokmans of the East, he himself deriving his name from the oriental Netophath. The brother of Satrugna is Lakshman. Plutarch in his Hellenica informs us that Labradeus a name of Jupiter in Caria, also applied as Labranda to a town of that region, was derived from *labrus* or *labra* signifying a battle axe in the Lydian language.[50] Now it is to be remembered that Lydia has very decided Arabian connections.

[47] Genesis Elucidated, by John Jervis-White Jervis, A.B., Trin. Coll., Dublin. London, 1852. p. 388.

[48] Hitzig, Urgeschichte und Mythologie der Philistaer. Leipzig, 1845. p. 116.

[49] Id. 128. [50] Plutarch. Hellenica ii., 301.

Besides that Ludim as a whole are derived from Amalek, the name of the king Sadyattes points to an old SADID or SHEDAD, while Alyattes and Alcimus, as compared with Attes and Aciamus, reveal plainly the presence of the Arabic article AL.[51] Can the initial *l* of *labrus* and *Labradeus* be of the same character as that of Alyattes? The Sanskrit and Persian languages will answer this question. In the former the word for such an axe, that, namely, with which the later Rama swept the Kshetriyas from the earth, is *parasu*, and in the latter it is *beret*, these being the equivalents of Al-brus and Al-brad. The whole word with the article in a purer form is found in the Irish *albard*, the Spanish *alabarda*, the German *Hellebard*, and the English *halberd*, which the Romaic, in profound ignorance of the original, has naturalized as *alamparda*. A word not unlike Labradeus is Labyrinth, the origin of which seems to be completely hidden. Yet ancient Persian history informs us that Menoutchehr dedicated to the moon a temple in Balkh called AL-BAHAR-NAU.[52] It is long since I first connected Menoutchehr of the old Persian story with MENCHERES of Egypt, who should rather

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51 Vide Rawlinson's Herodotus, Appendix, Book i., Essay i., On Chronology and Early History of Lydia.

52 "In libro Sadder cap. 43 memoratur Pyreum dictum Adurchura, i.e., ignis illuminationis rationis, q. d. mentis et rationis illuminatione aliquem inspirans. Estque juxta Kirman illud Pyreum, illeque Ignis illuc traductus ex Chorasan, seu Bactria, ut vult Shahristani. Haec hodie (ut alibi fusius dicetur) est Metropolitica Ecclesia Magorum omnium ad quam semel in vita sua tenentur veteres Persae omnes peregrinationem suscipere, sacrae visitationis ergo, ut olim faciebant ad antiquam Ecclesiam Cathedralem Azur-Gushtasp in Balch, seu Bactris et prout antea fecerant ad multo antiquiorem ibidem Cathedralem *Nau-Bahar*. Fuit enim in urbe Balch (ut mox dicetur) aliud antiquissimum Pyreum dictum *Nau-Bahar*, seu *Novum Ver*, propter vernantem ejusdem ornatum et picturas floridas." *Historia Religionis Veterum Persarum, &c., Autor Thomas Hyde, Oxon, 1760. p. 102.*

A short distance further on the author quotes Shahristani who, speaking of sacred edifices dedicated to the heavenly bodies, says: "Ex his etiam fuit Al-Nau-Bahar quam extruxit Rex Manushahr in Balch dedicata Lunae." I cannot agree with the interpretation of Nau-Bahar given by the learned author as *Novum Ver*, nor believe that the words are the same as those which now designate the *new year*, or the month answering to our April. "The word Behar," says Sadik Isfahani, "in the Hindi language signifies a school or college." *The Geographical Works of Sadik Isfahani translated. Oriental Translation Fund. London, 1832. Tahkik al Irab, Bihar.* The common word for college in Hindustani is *madrasa*, but this word *Behar* doubtless represents an older name for a building in which religion and education may have gone hand in hand. I cannot but view the form given by Shahristani in which *Nau* precedes *Behar* as an attempt to explain a term inexplicable save by the knowledge of an earlier stage of language and history. The final *nau* or the *inth* of *labyrinth* may easily have been the name of the goddess NEITH which is the same as MONTH the first part of the name of MENTCHERES, without the initial *M*.

A recent writer in the Edinburgh Review, speaking of the Buddhist temple which took the place of the Pyreum at Balkh, says, "It is especially worthy of remark that through all subsequent history the building retained the same Sanskrit name of Nava Vihara (corrupted into Now-Behar, and signifying 'the new monastery.')—Edin. Review, No. cclxxv., Art. 1., "The Book of Ser Marco Polo, the Venetian."

be called MENTCHERES or MONTH-RA. He is MENDES, to whom Diodorus[53] and Strabo[54] attribute the Labyrinth, all the connections of which were decidedly lunar. As for Balkh, it appears in BOULAK near Cairo and in other parts of Lower Egypt. Various writers admit that in Menoutchehr we have the Mandauces of Ctesias. He is followed among the Median kings by Sosarmus, and the latter monarch in the Assyrian list not only connects with Lampares and Lamprides his predecessors, reminding one of the Egyptian LABARES or LAMARES, but also with Mithreus and Teutamus his successors, who are most unmistakeably the Egyptian MESTRES and TOTHMOSIS.[55] I do not doubt that AL BAHAR NAU is the original form of the Labyrinth.

Perhaps the most striking instance of the use of the Arabic article is afforded by a comparison of two Celtic words with their equivalents in other languages. The first of these is the Gaelic and Erse *ban*, meaning *white*. In Hebrew it is LABAN, in Greek *alphos*, and in Latin *albus*, the *la* and *al* representing the article. The second instance is the Gaelic *beann*, the Irish *ben* and the Welsh *pen*, meaning a *hill*. These are the same as the Greek *bounos*, and with the Arabic article, give the Celtic and classical forms *Albain*, *alpeina*, *Alpes*, together with a certain Phoenician *Alpin*. The roots of *ban* and *ben* or *beann* or *pen* are not distinct, for the idea of mountains with white snow-clad summits connects with that of whiteness, just as LEBANON rises out of LABAN, white, it being pre-eminently the White Mountain range of northern Palestine. It is not a little singular, however, to find in the Celtic again, as in the case of the Welsh *ty*, a root form older than that of the Hebrew. Many things lead me to the belief that in the Hebrew LEB, meaning the heart, a similar case presents itself. With this word the affections of the heart are bound up, so that the German *liebe* and our English *love* are both derived from it. But it would almost seem that the root of the Hebrew word is found in AHAB, the verb *to love* in the same language. This AHAB, (the Arabic HEB,) assumes the aspirate form in AGAB, meaning the same, and gives the original of the Greek *agapaō;* but it also has an unaspirated and contracted form in ABAH. The latter form by a common phonetic change becomes AMAH, furnishing the original of the Latin *amo*, and,

[53] Diod. Sic. Lib. i., 61, 66.

[54] Strab. Lib. xvii., 1, 42.

[55] Vide Du Pin, Bibliothèque Universelle des Historiens. Amsterdam, 1708. Livre Premier, 211, &c.

rejecting the initial vowel, claims kindred with the Coptic ME. The Welsh *hoffi* may represent the Hebrew ABAH.

In conclusion, returning again to the Coptic article, let me present two more extensive illustrations than any hitherto given of the great importance of its recognition in questions of comparative philology. Bopp in his Comparative Grammar sets forth the following three pairs of words, signifying wolf in six different languages.[56]

Sanskrit.	*Zend.*	*Greek.*	*Lithuanian.*	*Latin.*	*Gothic.*
vrikas,	vehrko,	lukos,	wilkus,	lupus,	vulfs.

The Lithuanian is the Greek with the prefix of the Coptic article, and the same relation subsists between the Gothic and the Latin. The Danish form *ulv* is a softer form than the Gothic and nearer to the Semitic root, but the Latin *vulpes*, though denoting a fox, is the same as the Gothic *vulfs*. The Persian form for wolf, as we might expect, is not *velab* but *kelub*, the Cushite article replacing the Coptic. But this word in Persian as in Arabic means *heart*, which in Persian, Arabic and Hebrew is also LEB. The root LEB or LEV, which the Danish almost appropriates to the wolf in *ulv*, by the simplest kind of conversion in meaning from heart becomes the Sanskrit *lubh*, the German *lieben* and our English *love*. This introduces another wild animal, the lion, which in Coptic is LABOI, in Hebrew LEBI, and in German *Löwe*. But the words LEBI, *lion*, and LABAN, *white*, are connected in Hebrew, while in Latin *lupus* and *albus* take their place, and in Greek *lukos* and *leukos*. That the connection of the Greek with the Hebrew is a sound one will appear from the fact that even LIBNEH, *the white poplar*, answers to the Greek *leukē*. Lebana, Albunea, Leucothoe are one and the same goddess answering to the Celtic Blanchefleur. A trace of the Greek form for the *wolf* remains in the Scandinavian mythology, in which *Loki* is the father of the wolf Fenrir. Guigniaut points out the relation of the wolf to the ideas of light and whiteness.[57] But how are we to connect our first pair with the two others, *vrikas* with *lukos?* We may say that in Coptic *l* and *r* are interchangeable, and, having an agreement in *k*, the second consonant of the root, we may be satisfied. This is not enough however. The Lithuanian furnishes us with an important link. In that language *lokis*, which is simply the Greek *lukos*, and its own *wilkus* without the article, means not a *wolf* nor a *lion* but a *bear*. Now the bear and wolf connect in many parts of the

[56] Bopp's Comparative Grammar, vol. i., 163.
[57] Guigniaut, Religions de l'Antiquitè, Tom., ii., 109.

Greek mythology, and notably in that relating to Arcadia, where is Mount Lycaeus, where Lycaon's daughter Callisto, the she-bear, becomes the mother of Arcas, and where, while Leon, one of her brothers, takes his name from the king of beasts, another, Helix, reflects Helice, a name of the constellation Ursa Major. "The same changes," says Mr. Cox, "which converted the Seven Shiners into the Seven Sages, or the Seven Sleepers of Ephesus, or the Seven Champions of Christendom or the Seven Bears, transformed the sun into a wolf, a bear, a lion, a swan."[58] So far the Lithuanian *lokis* is the only word we have found, related to our six names for the wolf, which denotes the bear. The Sanskrit for wolf is *vrikas*, and the Zend *vehrko*. The *v* which begins these words, it must be remembered, is the Coptic article. Vrikas then, *wolf* though it mean, is simply *Arcas*, the bear, or, keeping to the Sanskrit, it is *riksha*, the bear, the bright one, standing in exactly the same relation to *vrikas* that *lokis* holds to *wilkus*. Professor Max Müller remarks upon the position which Sanskrit mythology gives to the bear as the bright animal, a position which we have already seen occupied by a Semitic lion and a Classical wolf, "We do not see why of all other animals the bear should have been called the bright animal. It is true that the reason of many a name is beyond our reach, and that we must frequently rest satisfied with the fact that such a name is derived from such a root, and therefore had originally such a meaning. The bear was the king of beasts with many northern nations who did not know the lion."[59] Going still further back into the Coptic we find the bright animal is the RUKH or jackal, the name for which designates *a live coal*, and which, as a member of the animal kingdom, is not unlike the wolf. There can be no doubt that *Arcas*, *riksha* and *rukh* are forms of the Hebrew YAREACH, the Chaldee YERACH, which like LEBANAH means the moon, and that the Chaldean URUKH or URHAMMU with his son ILGI[60] are other forms of Arcas and Lycus; URUKH himself being

"pater Orchamus; isque
Septimus a prisci numeratur origine Beli:"[61]

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[58] Cox's Mythology of the Aryan Nations. London, 1870. Vol. i., p. 165, note 3. Vide et. 230, 414.

[59] Science of Language. Series ii. Lecture viii.

[60] Rawlinson's Herodotus, App., Bk. i., Essay vi., The Early History of Babylonia. *Lenormant and Chevalier's Manual of the Ancient History of the East. London, 1869. Vol. i. p. 353.*

[61] Ovidii Metam, l. iv., 212.

and the father of

"Leucothoe,
Gentis odoriferæ quam formosissima partu
Edidit Eurynome,"[62]

Leucothoe is TILBIN or LEBANA, the famous goddess of Assyria, and the Albunea of Latin story. HURKI is the Babylonian name of SIN, the moon-god, whose principal temple was built in Hur by URUKH, and whose connection with bricks, according to Sir Henry Rawlinson, explains why the Hebrew LABAN *make bricks*, LEBENAH, *brick*, is almost the same as LEBANAH, *the moon*.[63] HURKI, URUKH, URHAMMU, Orchamus and even Arcas and Orcus are different forms of the Arab YERAKH or JORHAM, who was the ancestor of the great ARKAM family.[64] I need not say that the root of all these words is YERAH, the moon. The very frankincense shrub, that, by the command of Apollo, sprang out of the grave of the dishonoured daughter of this YERAKH or Orchamus, retains in Greek equally as in Hebrew her original name; for frankincense in these languages is Hebrew, LEBONAH; Greek, *libanos*.

The following table of twelve columns shows striking and interesting relations among languages belonging to at least two different families; and the variations of the words will be found to accord with much that has been said in regard to prefixes, while they set at nought many existing theories of comparative philology.[65] Of the twelve columns, five are occupied by the names of animals, the lion, bear, wolf, fox, jackal and dog; another five is taken up with words denoting light, brightness, whiteness, as bleach, white, bright, light, shine, milk, moon, silver; and the other two include heart, love and like.

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[62] Id., l. iv., 209.

[63] Rawlinson's Herodotus, App. Book i. Essay x, Religion of the Babylonians, &c.

[64] Lenormant and Chevalier's Manual, Vol. ii., 289. Jervis' Genesis, 191, 195.

[65] In this table, as throughout the essay, I have been compelled, owing to the absence of suitable founts of type, to print all the words in the ordinary character. The Coptic, Babylonian and Assyrian, Hebrew, Chaldee, Syriac and Arabic, Persian, Hindustani and Sanskrit words generally follow, in regard to form, the rules of Peyron; Norris, in his Assyrian Dictionary; Gesenius; Eichhorn; Sir W. Jones and Richardson; Forbes; Müller and Benfey. The Irish Dictionary employed is that of O'Reilly, and the Welsh, of Thomas Edwards. For *rompu*, a plural Egyptian form of the word denoting wolf, I am indebted to *Champollion's Dictionnaire Egyptien*, p. 83.

English	*heart*	love, like	lion	bleach, *white*	bright, light, *shine*	milk, to milk	*moon*	*bear*	whelp, *dog*	wolf	*jackal*, *fox*	silver.		
Coptic	selepiu	——	laboi	alhu, roch	lobsh, losg, rokh	ert, erote	——	laboi, arx	——	rompu, rukh	——	——		
Babylonian, &c.	labbu	——	lamma	——	——	——	Hurki, Urukh	——	gilbu	Ilgi	——	——		
Hebrew, &c.	leb, kereb	——	laish, laith(*Chal.*), laba	laban	lahab, labah, lahat	chalab	yerach(*Ch*), yareach	*dob*	kaleb	——	——	——		
Arabic	leb, kulb	lahej	lebut, leis	——	lehib, luh(luch)	leben, halab	yerah	dob	kilb	——	——	——		
Persian	kelb	——	lish, *shir*	——	tab, rushen	leben, shir	shahr	dob	ssakalib?	kelub	rubah.	rupi.		
Hindustani	ruh?	——	*sher*	——	roshn	——	——	——	——	——	lomri	rupe.		
Sanskrit	*hrid*	lubh, lash	——	——	las, loch, ruch, arch, *sur*	marj?	——	riksha	loma	vrikas	kroshtu, lopaca	rupiam, rajatam.		
Greek	*kardia*	——	lis, leon	alphos, leukos	glaukos, argos	gala-ktos, amelgein	——	arktos, Arkas	skulax	lukos, Lukaon	alopex	arguros.		
Romaic	*kardia*	——	leontara	chlomia, leukos	——	gala	——	arkouda	skuli	lukos	alepou, alopou	argurion.		
Latin	*cor-dis*	lubet, *caritas*	leo	albus	lumen, lux	lac, mulgere	Orchamus	ursus	——	lupus, hirpus	vulpes	argentum.		
Italian	*cuore*	——	lione	albo, bianco	lume, lucere	latte	——	orso	——	lupo	volpe	argento.		
French	*coeur*	——	lion	aube, blanc	lumiere, luire, luisant	lait	——	ours	——	loup	——	argent.		
Spanish	*corazon*	——	leon	albo, blanco	luz	leche	——	*oso*, ursa	galgo	lobo	raposo	argen, *plata.*		
Portuguese	*coraçao*	——	leao	alvo, branco	luz	leite	——	urso	galgo	lobo	raposo	*prata.*		
Sclavonic and Lithuanian	*szirdis*	lubic	lew	——	luc	milzti, mleko	——	lokis	——	wilkus	lis	serebr.		
Welsh	*craidd*	*cariad*	llew	——	goleu	llaeth, blith	llenad	arth	——	——	——	arian.		
Gaelic and Erse	*cridhe*	colbha, *cridha*	leon, leomhan, leoghan	*ban*, blath	gealadh, loiche	lacd, bleachd, leim	gealach	brach, art	——	breach, cliabac	loisi	airgiod.		
Danish	*hierte*	elske	löve	bleeg	blank, lys	melk	——	——	hualp	ulv, Loki	——	sölv.		
Dutch	*hart*	liefde	leeuw	bleek	licht	melk	——	——	——	wolf	——	zilver.		
German	*herz*	lieben	löwe	bleiche, blass	blank, licht	milch	——	——	——	warg(*oldG*), wolf	——	silber.		

The forms presented in the above table, excepting those in italics, which, like *sur* and *shir*, *dob* and *tab*, exhibit interesting relations, although unconnected with the roots under consideration, may be reduced to four. In the first the initial *l* combines with *b*, *bh*, *v*, *p*, *ph*, *f*, *w*, *m*, *n*, and even a mere vowel, as in leo, while in the second it unites to form the root with *c*, *ch*, *k*, *x*, *g*, *gh*, *j*, *z*, *s*, *sh*, and even *h* or a vowel. In the third and fourth an initial r takes the place of the *l* of the first and second. The prefixes vary from a simple vowel or breathing to well developed representatives of the Coptic and Cushite articles. The most common affix is that in *d* or *t* as in light, licht, lacd, llaeth, galaktos, lebut, lahat, art, lleuad, airgiod, argentum, arktos, rajatam, which sometimes acquires such power as to extinguish the second consonant of the root.[66]

I. First Form in l.

l—p.		l—b.		ssakalib,	Pers. dog.
loup,	Fr. wolf.	labah,	Heb. light.	cliabac,	Erse wolf or fox.
lupo,	It. wolf.	labbu,	Bab. heart.	l—bh.	
lupus,	Lat. wolf.	laboi,	Copt. lion, bear.	lubh,	Sans. to like.
lopaca,	Sans. fox or jackal.	laban,	Heb. white.	colbha,	Erse love.
alepou,	Rom. fox.	leb,	Heb. heart.	l—v.	
alopex,	Gr. fox.	leb,	Arab. heart.	love,	Eng. love.
selepiu,	Copt. heart.	lebi,	Heb. lion.	löve,	Dan. lion.
hualp,	Dan. whelp.	leben,	Arab. milk.	alvo,	Port. white.
whelp,	Eng. whelp.	leben,	Pers. milk.	ulv,	Dan. wolf.
volpe,	Ital. fox.	lebut,	Arab. lion.	sölv,	Dan. silver.
vulpes,	Lat. fox.	lieben,	Ger. to love.	silver,	Eng. silver.
l—ph, f.		lobo,	Span. wolf.	l—w.	
alphos,	Gr. white.	lobo,	Port. wolf.	lew,	Scl. lion.
wolf,	Eng. wolf.	lobsh,	Copt. light.	llew,	Welsh lion.
wolf,	Ger. wolf.	lubet,	Lat. to like.	löwe,	Ger. lion.
wolf,	Dutch wolf.	lubic,	Scl. to like.	l—vowel.	
l—m.		albo,	Ital. white.	leao,	Port. lion.
lamma,	Bab. lion.	albo,	Span. white.	leo,	Lat. lion.
laomhan,	Erse lion.	albus,	Lat. white.	goleu,	Welsh light.
leim,	Erse milk.	silber,	Ger. silver.	l—vowel+n.	
loma,	Sans. dog.	chalab,	Heb. milk.	leon,	Gr. lion.
lomri,	Hind. fox.	gilbu,	Bab. dog.	leon,	Span. lion.
lume,	Ital. light.	kaleb,	Heb. dog.	leon,	Erse lion.
lumen,	Lat. light.	keleb,	Pers. heart.	leontara,	Rom. lion.
lumiere,	Fr. light.	kelub,	Pers. wolf.	lion,	Eng. lion.
chlomia,	Rom. white.	kilb,	Arab. dog.	lion,	Fr. lion.
		kulb,	Arab. heart.	lione,	Ital. lion.

Intermediate forms l—aspirate, or vowel followed by b, d, &c.

lahab,	Heb. light.	alhu,	Copt. white.	lait,	Fr. milk.	llaeth,	Welsh milk.
lehib,	Arab. light.	luire,	Fr. to shine.	laith,	Chald. lion.	blith,	Welsh milk.
lahat,	Heb. light.	lahej,	Arab. to like.	leite,	Port. milk.	blath,	Erse white.
gealadh,	Erse light.	lleuad,	Welsh moon.	latte,	Ital. milk.	skuli,	Rom. dog.

[66] The following analysis of the table is suggestive.

II. Second Form in l.

l—c, k.

lac-tis,	Lat. milk.	milk,	Eng. milk.	galgo,	Port. dog.
lacd,	Erse milk.	mleko,	Scl. milk.	mulgere,	Lat. to milk.
luc,	Scl. light.	l—ch.		amelgein,	Gr. to milk.
lucere,	Ital. shine.	leche,	Span. milk.	l—gh.	
leukos,	Gr. white.	licht,	Ger. light.	light,	Eng. light.
like,	Eng. to like.	loiche,	Erse light.	leoghan,	Erse lion.
Loki,	Dan. father of Fenrir.	loch,	Sans. light.	l—s.	
lokis,	Scl. bear.	luch,	Arab. shine.	las,	Sans. light.
lukos,	Gr. wolf.	bleach,	Eng. make white.	leis,	Arab. lion.
Lukaon,	Gr. father of Arcas.	bleachd,	Erse milk.	lis,	Gr. lion.
elkse,	Dan. to love.	bleiche,	Ger. white.	lis,	Scl. fox.
bleek,	Dutch white	gealach,	Erse moon.	loisi,	Erse fox.
blanc,	Fr. white.	milch,	Ger. milk.	luisant,	Fr. shining.
blanco,	Span. white.	l—x.		lys,	Dan. light.
blank,	Ger. shining.	lux,	Lat. light.	blass,	Ger. white.
blank,	Dan. shining.	skulax,	Gr. dog.	l—sh.	
wilkus,	Scl. wolf.	l—g.		lash,	Sans. like.
gala-ktos,	Gr. milk.	Ilgi,	Bab. son of Urukh.	laish,	Heb. lion.
glaukos,	Gr. shining.	losg,	Copt. light.	lish,	Pers. lion.
melk,	Dan. milk.	bleeg,	Dut. white.	l—z.	
melk,	Dutch milk.	galgo,	Span. dog.	luz,	Span. light.
				luz,	Port. light.
				milzte,	Scl. milk.

III. First Form in r.

r—p.				r—b.	
raposo,	Span. fox.	rupi,	Per. silver.	rubah,	Pers. fox.
raposo,	Port. fox.	rupiam,	Sans. silver.	kereb,	Heb. heart.
rupe,	Hind. silver.	rompu,	Copt. wolves.	serebr,	Scl. silver.
		hirpus,	Lat. wolf.		

Intermediate forms r—aspirate, or (vowel followed by) t, &c.

yerah,	Arab. moon.	erote,	Copt. milk.	art,	Erse bear.
arian	Welsh silver.	ert,	Copt. milk.	arth,	Welsh bear.

IV. Second Form in r.

r—k, kh.

riksha,	Sans. bear.	arch,	Sans. shine.	arguros,	Gr. silver.
rukh,	Copt. shine.	brach,	Erse bear.	warg,	O. Ger. wolf.
rukh,	Copt. jackal.	breach,	Erse wolf.	Romaic, Italian, French, Spanish, same as Greek and Latin of silver.	
Arkas,	Gr. son of Lukaon.	yereach,	Heb. moon.		
arkouda,	Rom. bear.	Orchamus,	Chald. moon.	r—j.	
arktos,	Gr. bear.		Lat. father of Leucothoe.	rajatam,	Sans. silver.
Urukh,	Bab. father of Ilgi.	r—x.		marj,	Sans. milk.
		arx,	Copt. bear.	r—s.	
hurki,	Bab. moon.	r—g.		ursus,	Lat. bear.
vrikas,	Sans. wolf.	argos,	Gr. shining.	French, Italian, Spanish, Portuguese same.	
branco,	Port. white.	airgiod,	Erse silver.	r—sh.	
r—ch.		bright,	Eng. shining.	roshn,	Hind. shine.
roch,	Copt. white.	argentum,	Lat. silver.	rushen,	Pers. shine.
ruch,	Sans. light.			kroshtu,	Sans. jackal.

The prefixes found in the above are the vowels a, e, i, o, u, and the diphthong ai, neutrals; b, v, vu, whe, wi, wo, m, ma, me, mi, mu and ame, b sounds; and k, ka, ke, ki, ku, sku, c, ch, cha, co, g, ga, gea, gi, go, se, si, so, ya, ye, hi, hu and hua, c sounds. The affixes, an element of far less importance, are the five vowels and the diphthongs ia, iu, oi and ou; among the liquids iam, amus, an, aon, en, han, r, er, ri, uros, urion; of c sounds ex, ac, aca, ic, as, es, is, os, oso, us, sh, sha, ah, oh; and of d sounds d, ad, adh, iod, ouda, t, th, at, atam, ath, et, entum, ote, ut, te, tis, tos, tu. The consonants which have usurped the place of simple vowels between the letters of the root are *m* as in rompu, *n* as in blanco, branco, and *s* as in elske, losg.

The table might easily be extended by introducing other words, such for example as *yellow*, the German *gelb*, the Hebrew *yarak*, the Welsh *lleb-liw*. It is however sufficiently large for the purpose for which it is intended.

My last example exhibits unmistakeably the presence of the Coptic article in the transmission of the root through different languages. The book of Exodus makes us acquainted with a town in Lower Egypt called PITHOM, which the captive Israelites helped to build for their oppressors.[67] This town appears to have been situated upon the eastern bank of the Pelusiac branch of the Nile, to be the Patumos of Herodotus and the THUM of the Itinerarium Antonini. There is not the least doubt that the initial Pi or Pa is the Coptic article. Sir J. G. Wilkinson connects THUM with the Egyptian THMEI, the Hebrew THUMMIM, the Greek *Themis*, and, in a secondary degree, is correct in his etymology.[68] In the book of Numbers, however, we are informed that the whole of the desert region near which this town lay, extending from it to the Red Sea, was called ETHAM, a name applied also to an extensive tract on the opposite shore of Arabia Petræa.[69] Many writers agree that ETHAM and PITHOM or Patumos are variations of the same root, the latter, denoting a town, being a definite form of the former. The word, ETHAM, however, at once associates itself in the mind of the student of Egyptian history with the name of the solar god ATUM or ATMOU, "who is called ATHOM, and gives his name to the city of Thoum."[70] The figure of a plough, which forms part of this god's name spelt hieroglyphically, sends us to the old Coptic and Hebrew root, ETH, a ploughshare,[71] while many circumstances prove that *m* is no part of the root.[71*] Thus, Jacob Bryant says, "It is said that the Israelites came into the region of ETHAM, which is still called Etti, the inhabitants of which were the Autaei of Pliny."[72] Another writer, although guilty of the error of confounding Gatam

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[67] Exodus i. 11.

[68] Rawlinson's Herodotus Book ii. 158.; note 5.

A popular account of the Ancient Egyptians, ii. 250, &c.

[69] Exodus xiii., 20. Numbers xxxiii, 6 8. The Septuagint form of this name is *Othom*. Jablonsky views it as the Coptic ATIOM, *the boundary of the sea*.

[70] The History of Egypt, from the earliest times till the conquest by the Arabs, by Samue Sharpe. London, 1870. Vol. i., 113.

[71] Osburn, Monumental History of Egypt, Vol. i., 340.

[71*] Theophilus calls the Egyptian city Peitho. "Οι μεν Εβραῖοι κατ' ἐκεῖνο καιροῦ παροικήσαντες ἐν τῇ Αἰγύπτῳ, καὶ καταδουλωθέντες, ὑπὸ βασιλέως, ὡς προείρηται, Τεθμῶσις, ὠκοδόμησαν αὐτῷ πόλεις ὀχυρὰς, τὴν τε Πείθω καὶ Ραμεσῆ."—Autolycum iii.. 20.

[72] Observations upon the plagues inflicted upon the Egyptians, &c., by Jacob Bryant. London, 1794, (e libris Benj. Workman, Esq., M.D.) p. 404.

son of Esau with the god ATUM, yet correctly adds, "the name occurs as well in the Autei of Pliny, and the modern BENI ATIYEH of Burckhardt and the Desert of TIH."[73] Pliny mentions the fact of these same Autei dwelling within the borders of Egypt.[84] BOUTAN a later name of Thoum or Pithom, BATHAM, the land of the Arabian Autei, and the PHATHMETIC mouth of the Nile, shewing different forms of the same word, testify to an original connection.[75] The word Autei is not unlike Aetos, the ancient name of the Nile, with which Diodorus connects the myth of Prometheus.[76] I am not aware that we have any more definite confirmation of the application of this name to the great river than the existence of the term Phathmetic as applied to a branch of it. Aetos, however, is a word meaning eagle in Greek, and is the Hebrew AIT or GAIT, *a bird of prey*,[77] whence, doubtless, came by the prefix of *m* the Coptic MAUT, the *vulture*. But just as ETH, the plough, gives ETHAM, so we have a geographical name in the tribe of Simeon, derived from AIT, namely, ETAM, also called ETHER.[78] A link, which connects the god ATHOM with water, and the Nile in particular, is found in his association with the lotus, a plant sacred to that river. The name of the lotus among the Egyptians was NOFRE, the modern Nuphar, now applied to a genus of water-lilies closely allied to the Nymphaea and Nelumbo genera, between which the lotus is to be found.[79] NOFRE, however, was a name of ATHOM, who bore the lotus upon his head.[80] The word NOFRE, which, among other meanings, has that of *good*, is found in NEPHERCHERES, the name of an Egyptian king; *nebris*, the Bacchic fawn skin often pictured on Egyptian monuments in intimate connection with NOFRE-ATHOM; and NIPUR or NIFFER, a famous place among the ancient Babylonians, with which may be joined KHARRIS NIPRA, the celebrated temple, the name of which inverts the Egyptian NEPHERCHERES.[81] Turning now from Egyptian to Hindoo

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[73] Jervis's Genesis, 469.

[74] Plini Hist. Nat. Lib. vi., 33.

[75] Galloway, Egypt's Record, 511, 512, 515. Hengstenberg, Egypt and the Books of Moses trans. Edin., 1845, p. 49.

[76] Diod. Sic. i. 19.

[77] Vide Gesenii Lexicon in loc.

[78] Joshua, xix. 7. i. Chron. iv. 3.

[79] Lindley's Vegetable Kingdom. Lond., 1853, pp. 410, 414.

[80] Wilkinson's Popular Account of the Ancient Egyptians, Vol. i., 256. Vide et. 285. Kenrick's Ancient Egypt under the Pharaohs, i., 331.

[81] Rawlinson's Herodotus, App., Bk. i., Essay, x., 2. (iii.)

mythology, we find the lotus, a sacred plant, dedicated to Lakshmi or Sri, the Indian Ceres, who is called Padma-Devi, or the goddess of the lotus, Padma being one of the names of this plant.[82] Another name for it is Tamara. I have no hesitation in identifying Padam with PITHOM or P-ATHOM, and Tamara with THAOM-RA, names of the Egyptian solar god. Not only does the plough of ATHOM suit a connection with Ceres or Sri, but we also find in Arabian tradition that the brother of the YODHAM or ETHAM, who gave his name to a portion of the stony peninsula, is LAKHM, a form holding the same relation to Lakshmi that Lokman does to Lakshman.[83] One of the most interesting geographical connections of the word under consideration is furnished by the geography of Palestine, to which, in its southern region, I have attributed the beginnings of civilization. Near BETHLEHEM, which is the *House* of LACHM or *bread*, are found, according to Josephus, the springs of ETHAM, whence flows the TAAMIREH river.[83*] It is not at all improbable that Tamara may be the same word as the Hebrew TAMAR, a palm tree, the connection being found in the Rhamnus Lotus of the ancients, the *Zizyphus lotus* of botanists.[84] The fruit of these trees and the seeds of the Nymphæa and Nelumbo were very early important articles of food, and might well be classed among the chief gifts of Ceres. The lotus, again, is the favourite plant of Isis, who is the same as Lakshmi or Padma, since she stands to Osiris in the same relation as the latter bears to Iswara. The child of ISIS is HARPOCRATES or SEMPHUCRATES, who is generally represented sitting upon the lotus leaf.[86] This SEMPHU-CRATES is identical with the Indian Swayambhuva, and Swayambhuva is Adima, Yotma, or

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[82] Researches concerning the laws, theology, learning, commerce, &c. of Ancient and Modern India, by Q. Crawford, Esq., Lond. 1817. Vol. i., 145, &c.

[83] Sale's Koran. Genealogical Table of the Descendants of Kahtan. The name Lakhm or Lakshmi is the Hebrew LACHAM, *eat*, LECHEM, *bread*, *fruit of a tree*, Arabic *food;* and is thus a fitting name to connect with Ceres.

[83*] The Birthplace of Ancient Religions and Civilization. Canadian Journal, Aug. 1871, p. 171, seq.

Joseph. Antiq. viii., 7, 3. Ritter's Comparative Geography of Palestine. Translat., Edin., 1866, iii. 81, 93-4, 333-40.

Vide Psalm lxxiv, 15, where the same name in the Septuagint is rendered in our English version by the word *mighty*.

[84] Lindley's Vegetable Kingdom, 582.

[85] Guigniaut, Religions de l' Antiquité. Tom. i., 161.

[86] Id., iv., 46.

Banier, La Mythologie et les Fables expliquées par l'histoire. Tom. i., 493.

Atma.[87] The creation of the first Menu is that *of the lotus*, but the first Menu is Swayambhuva.[88] The names Semphucrates, and Harpocrates, taken in connection with the forms ATHOM and Thamara, which is just ATHOM-, or, as he is often called, THAOM-RA, the RA denoting his solar character, at once suggest Melcartus the son of Demarous, Gordys, the son of Demophoon, and Meli-certa, son of Athamas. To these might be added the Persian Tahmouras, another solar personage, with his pre-eminently solar successor, Djemschid, often identified with Melcartus. The solar character of THAOM-RA and Tahmouras combines with the Ceres relationships of Gordys in the Tamara leaf of India, which surrounds the sacred fire in certain representations.[89] The Indian Atma is the soul, and as such connects not only with the Greek *thumos*, meaning the same, but with the old Homeric *aütme*, *breath*, in which we see the German *Athem*.[90] It is interesting to observe the different forms of the name ETHAM, as THOUM, AITAM and ATHOM, reproduced in these three related words. The Greek *atmē*, *vapour*, undoubtedly belongs to the same root. As we have already connected MAUT, the Egyptian name of the vulture and symbol of maternity with the Greek *aetos*, and the Hebrew AIT, and thus, with ETAM, derived from the latter, so, in Indian mythology we find Adima, under the two forms Atma and Yotma, producing Mout and Mahat.[91] There can be no doubt that the Sanskrit Adima, Atma, Yotma, Tamara and Pedma represent the Egyptian ATHOM, TAOM-RA and Pithom, the Arabian YODHAM, and the Hebrew ETHAM and ETAM. We have seen that in Egypt this name connected itself with the Nile and with water generally. The same is true in regard to its Indian connections. Swayambhuva or Adima is the god of the flood as well as a near relation of the lotus. Greek names, that point to a marine or aquatic connection more clearly than *aetos* or *atmos* are Athamas, whose story is bound up with the sea, who gave his name to an extensive plain, and whose son Ptous is immortalized by a place in Boeotia, called Ptoum; great Thaumas son of Pontus; and Thamyris the Thracian bard, whose name

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[87] Guigniaut, Tom. i., 254, 270, 647, &c.
Sataroupa (Sterope) or Prakriti (Procris) forms a bond of union between these names.
[88] Crawford's Indian Researches, 33, 92.
[89] Maurice's Indian Antiquities, Vol. i., Pt. i., 396.
[90] Guigniant, Tom. i., 647.
[91] Id., i., 270, 647.

survives, like that of Adonis, in a river of Phoenicia, the Tamyras. Hitzig insists on the connection of the Sanscrit Tamara and *tama* with water;[92] and both of them we find as names of rivers, or as forming the base of such names, in India, Palestine, Spain, Britain, and indeed throughout the whole of the Indo European and Semitic areas.[93] Herodotus informs us that Thamimasadas is the Scythian name for Neptune, and all are agreed that while *masadas* stands for ruler or god, *thami* is water or the sea.[94] Strabo quotes Polybius as his authority that the people at the head of the Adriatic called the river Timavos the "mother of the sea;"[95] and from Pliny we learn that the Scythians named the Maeotis Temarunda, which meant the same.[96] In the language of the ancient Irish, who claimed Scythian ancestry, *tamh* signified the ocean, and in an old Assyrian dialect it is TAMTU. We have thus presented to us a word of Egyptian origin, designating a god, applied to a water plant, and conveying the idea of water, especially as found in rivers, in many different forms, the principal of which are THOM, ATHOM, PITHOM. The loss of the initial vowel need be no more a subject of surprise than the prefix of the Coptic article. Strabo tells us that the Thessalian Ithome was originally called Thome but acquired in some way another syllable.[97] This is possible, but it is more than likely that the two forms came from Egypt, where THOM and ATHOM were interchangeable from a very early period. Without entering more into detail, or pushing our researches for the present beyond the bounds of the Greek language, this paper may fittingly come to a close with a fourfold illustration or proof of the transference of Coptic words, article included, into languages of the European family. The word Patumos, which Herodotus gives as a Greek form of PITHOM, is the same as *potamos*, a river, for which such far-fetched derivations as *potimon hudor* have been proposed; and thus the ancient name of the Nile, which, in the forms of the English Thames and Tamar, gives brotherhood to many

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92 Hitzig, die Philistaer, 230.

93 Such are the Tomerus of Arrian or Tonberos of Pliny; the Wady Taamirah that runs to the west of the Dead Sea; the Tamaris of Spain; the Tamarus and Thamesis of Britain. Vide Arriani Indica xxiv.; Plinii Hist. Nat., Lib. vi., 25; Ritter's Comparative Geography of Palestine, vol. iii. 135; Pomponii Melae De Situ Orbis, Lib. iii. 1, 81; Six Old English Chronicles—Richard of Cirencester on the Ancient State of Britain, and Appendix, Bohn.

94 Rawlinson's Herodotus, Appendix, Book iv., Essay ii. 7.

95 Strab. vi., 1, 8.

96 Plinii Hist. Nat., Lib. vi. 7.

97 Strab. ix., 5, 17.

streams in the three continents of the Eastern Hemisphere, and even designates the sea itself in certain tongues, becomes, with the prefix of the article, by virtue of a strange forgetfulness on the part of the Greek, not more definite or particular, but a general term for every river that flows. That the word is not confined to rivers is, however, evident in Potamia, a district of Paphlagonia,[98] and Potamus an Attic deme of the tribe Leontis,[99] which reproduce BATHAM and PITHOM of Arabia and Egypt. The *nuphar* of ATHOM and the *padma* of Lakshmi appear indeed in the Greek lotus of many ancient memories; but the very Sanskrit *padma* lives again in the *butomus*, a name originally denoting a water plant, and now applied to an order of aquatics presenting certain evident points of analogy with the water lilies, among which the lotus is found.[100] Besides the *Potamoi* of Homer, various Greek heroes and demi-gods have been mentioned who represent in the language and mythology of their country the Egyptian ATHOM or THAOM-RA, the Arabian YODHAM and the Indian Yotma or Adima. Did space permit I might show that in this ancient word the oldest traditions of India and Greece, of German and Celtic nations unite, so that on Egyptian ground Buddha and Cadmus, Odin and Hu may be brought to unity. Finally the name Potamon is not unknown to Greek mythology. In him we may expect to find the hero real or imaginary after whom the Paphlagonian district, the Attic deme and the whole tribe of rivers were called. Apollodorus had a true tradition of the origin of the name, and makes assurance doubly sure by calling him Potamon, the son of Ægyptus.[101]

98 Id. xii., 3, 41.
99 Id. ix., 1, 22.
100 Lindley's Vegetable Kingdom, 208.
101 Apollodori Bibliothecæ, ii., 1, 5.

LUNAR INFLUENCES.

FROM 41 YEARS' OBSERVATIONS IN AND NEAR TORONTO.

BY THE (LATE) REV. CHARLES DADE, GEORGETOWN, ESQUESING.

(Read before the Canadian Institute, Feb. 3rd, 1872.)

There is scarcely an article of belief more deeply rooted in the mind of man, and more universally diffused than that of the moon's influence upon all things both animate and inanimate upon this our globe. It is not only the subject of the most refined speculations which have ever exercised the human intellect, extending to the most stupendous operations of nature, but is made to interfere in the most commonplace concerns of every-day life. To pursue the matter through all its bearings would be a tedious and unprofitable task, and a mere record of childish and absurd superstitions. Many of these chimeras, though sanctioned by high-sounding names and venerable antiquity, have vanished. But one dogma has survived. Traced back to the remotest ages, it still exists in the present generation, and, we might almost say, among all nations and kindred and people. Job could talk of the "mild influences of the Pleiades," and David uttered a prayer that the "sun may not hurt thee by day, neither the moon by night." Thus, the idea that our satellite exercises dominion over the aerial as well as the ocean wave is one of almost universal acceptation. From the pilot or fisherman, who looks upon the Saturday moon with dread as the harbinger of a storm, to old Betty in the kitchen, who looks upon her as materially affecting her culinary operations, farmer, gardener, lounger, lover, all have their several aphorisms bearing upon this branch of planetary affection, without, perhaps, being able distinctly to enunciate in what their opinion consists. The popular argument is of the "Pourquoi non?" description. If it is proved beyond all controversy that the tides of ocean are subject to lunar control, why not those also of that aerial ocean which encompasses our earth? Thus, in a review of "Murphy's Anatomy of the Seasons," published in 1835, the writer remarks: "In this present work Mr. Murphy has undertaken to reduce the weather to method by insisting on its intimate connection with astronomy. To part of this we readily subscribe. That the

moon, which acts so powerfully as a perturbing force on the tides, should not also agitate the atmosphere with a corresponding reciprocation it is unreasonable to question." Sir W. Herschel, on the contrary, remarks as follows: "The moon is often appealed to as a great indicator of the weather, and especially its changes as taken in conjunction with some existing state of wind or sky. As an attracting body causing an aerial tide, it has, of course, *an* effect; but one utterly insignificant as a meterological cause, and the only effect distinctly connected with its position with regard to the sun which can be reckoned upon with any degree of certainty is its tendency to clear the sky of cloud, and to produce not only a serene, but a calm night, when so near the full as to appear round to the eye, a tendency of which we have assured ourselves by long continued and registered observation. The effect in question, so far as the clearance of the sky is concerned, is traceable to a distinct physical cause: the warmth radiated from its highly heated surface; though why the effect should not continue several nights after the full, remains problematic."

Dr. Lardner, in his "Lectures on Science and Art," New York, 1846, has entered largely upon the subject. "Two ways," says he, "of enquiring, theory and fact, are the only methods of legitimate enquiry. Present state of physical science not equal to the first, and the latter defective from the want of reliable and long continued observations." The great advance which is now taking place in most civilized countries in the diffusion of meteorological enquiry will no doubt do much for the solution of this and other problems. In Canada, for instance, we may specify effect produced by clearing on temperature and agriculture generally, cause of January thaw, Indian summer, subject of cycles, with many other interesting topics of enquiry, which nothing less than sedulous and long continued observations, carried on through the length and breadth of the land can determine We, of the present generation, must content ourselves with carrying the hod, hewing the stone, and providing materials for the temple of Science, without which the genius of the designer and architect will be of no avail. Had meteorology, like astronomy, been blessed with the labours of an Hipparchus or Ptolemy, we should not now be subject to those errors and delusions, especially as to the climate of this our country, which have produced so evil an effect upon its onward progress. But when we reflect that it is only a few years since the ordinary meteoro-

logical quantities have been accurately determined, and that only in a few localities, we must be fully sensible that the noble efforts now being made must be extended and amplified indefinitely to meet the wants of coming generations.

The following paper is intended simply to show the connection (if any) between lunar phases and positions and the various phenomena of the weather in this locality during the space of forty-one years, deducting trifling exceptions noted in their places. This period, though a considerable item in the life of man, is but a comparative trifle in that of a science, but still is worthy of record, especially since no attempt is made to ground any theory upon it, or to draw general conclusions from isolated and perhaps exceptional cases. A careful record of the conditions of the weather has been kept, and it is divided into two distinct classes, termed *(f)* and *(s)*, fine and stormy, which may be liable to some misunderstanding; but all things considered, seems the best that can be adopted. *F*, then, denotes a day entirely free from all atmospheric disturbances; *e. g.*, rain, snow, hail, thunder and lightning, gales, &c. *S*, all others. So that *f* does not represent necessarily what in common parlance is called fine, nor would *s* be strictly speaking "stormy," but may be somewhat interchanged. This is done to avoid the ambiguity of the term and the bias every one is under to support a favourite theory. The only objection is, that by this method we scarcely give the moon her due, for many days would be called *s*, which in common acceptation might be called *f*, which would lead to a further element *(v)*, or variable; thus rendering the matter too complicated.

The days noted are those

Before, On, After } New, Full } Moon. Before, On, After } Perigee. Apogee.

Thus forming combinations, taken three and three together, of *f, f, f; s, s, s.*

Thus, *f, f, f*, would represent a period of the three days before mentioned, entirely consisting of fine weather; and *s, s, s*, entirely of storm, or variable. To get the number of days in their several classes for the entire period, those are reckoned according to the initial letter, and the sum taken, and thus a comparison is made of the number of fine and stormy days at the several epochs of the new and full moons, and Perigee and Apogee.

From these tables the following results arise:

$$s : f \begin{cases} :: 142 : 340 \text{ for the New Moon.} \\ :: 144 : 344 \text{ for the Full Moon.} \end{cases}$$

Which indicates, as might have been anticipated, a very trifling difference, and it is to be borne in mind, as was before observed, that s is used in a far more extended sense than usual.

We may extend the subject further, by comparing s and f on the days preceding.

The next subject of enquiry is, how far the conditions of the weather are affected by the moon's position in her orbit.

After making the deductions for absence, as in the case of the ☽ and ⊕.

Five days before Moon's entering Perigee, 331 to 182.
" " Apogee, 323 to 188.

Next, considering the actual days of Apogee and Perigee.

Perigee, fine, ditto stormy or variable :: 320 : 191.
Apogee, fine, ditto stormy or variable :: 325 : 178.

And making the same calculation for the number of fine and stormy days immediately following Perigee and Apogee.

$f : s$ :: 311 : 200, reckoning from the days respectively following Perigee and Apogee, $f : s$ :: 332 : 200.

Those who imagine that they can trace an analogy between lunar influence as affecting the aerial and ocean wave, would expect that fair weather should prevail at ☽ and ⊕, and stormy at the quarters. Arago estimates the effect of lunar attraction on the barometer not to exceed $\frac{1}{100}$ of an inch.

Dr. Lardner concludes summarily:

That the popular opinion of lunar influence on the weather has no foundation in theory, or rather that modern science is incompetent to frame a theory on the subject; or no correspondence with facts. Or rather (might he not have said), meteorology in its present defective state, is not furnished with an adequate apparatus of data.

Ages ago, Aristotle admirably observed, that the ancient philosophers, instead of building their theories upon careful examinations of nature, pursued the opposite and erroneous one of endeavoring to warp the phenomena of nature so as to suit their own favorite dogmas and theories. A fatal error, subversive of all true philosophy, and which has infected every branch of science and meteorology in no small degree.

CLASSICAL NOTES.

BY W. D. PEARMAN, M.A.,
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In the course of my last year's reading I met with several passages, in various classical authors, the received explanation of which seemed to me unsatisfactory. In the following instances I have ventured to propose a different explanation.

During a recent visit to Cambridge I communicated with several classical scholars, among others Messrs. Shilleto, Munro, and J. E. B. Mayor, and in most instances they expressed themselves satisfied that the explanation proposed was correct.

In the Gorgias of Plato (505 E), *ἀναγκαιότατον* is taken to signify "necessity," and the interpreters have exercised their ingenuity to disguise the awkward phrase "most necessary." An examination of the context led me to suppose that *ἀναγκ·* had here its not unusual sense of "barely sufficient," *e. g.*, Plat. Rep., *ἀναγκαιοτάτη πόλις*, "the least one could call a city," "a city composed of the fewest possible elements."

In the case before us, Socrates observes, that if one man did the work of two (*i. e.* if he carried on the dialogue himself) it would be *ἀναγκαιότατον*.

Homer. Odyss., xii. 82. *Πρὸς ζόφον* is here taken to signify "towards the northwest," but may be also translated "towards sunset," or "at sunset:" cf. *πρὸς ἠῶ*. We should then have "a cave dreary and dark at sunset turned into blackest night," or the idea of Shelly's Cenci, in the description of a mountain pass,—

> "At noon-day here 'tis twilight,
> And at sunset blackest night."

Sophocles Antigone, 263. The MSS. give *ἀλλ' ἔφευγε τὸ μὴ εἰδέναι*. Hermann in (*metri causa*) *ἔφυγε*. It occurred to me that the difficulty of supplying *πᾶς τις* out of the previous *οὐδεις* and giving *φεύγω* the meaning of *ἀποφεύγω* might be avoided by making *τὸ μὴ εἰδέναι* the subject of *ἔφυγε*, *μὴ εἰδέναι* being a quotation from the answer of the person accused, *i. e.*, "'Don't know' was the defendant."

Demosthenes Phil., I. § 15: *μὴ κωλύων εἴ τις ἄλλος κ. τ. λ.* The speaker is here generally supposed to say that *he* offers no opposition, &c., but this creates a difficulty; as we should expect *οὐ κωλύων* in this case and not *μη*, may we not take it as a nominative absolute? "unless whoever else has any grand proposition, forbids one to speak;" *εἴ τις ἄλλος κ. τ. λ.*, standing in the place of *(verbi causa) Αἰσχινης.*

Euripides, Phœnissæ, 583: *δύο κακὼ σπεύδεις τέκνον Κείνων στέρεσθαι, τῶνδέ τ' ἐν μέσῳ πεσεῖν.* Paley says that the sense is much the same as our "between two stools," but does not explain or illustrate this somewhat unusual and difficult construction. It seems best to explain it as the editors do the passages, Aristoph: Aves, 187: *ἐν μέσῳ δήπουθεν ἀήρ ἐστι γῆς*, and Acharn: 433, *καὶ ἐκείνων* being omitted as one of the points between which a thing is described as lying.

Cicero I., Catil. c. vi.: MSS. give *multo post.* Editors have altered into *multa post, &c.* The MSS. reading *multo post* seems to point to an original *multis.* The change from *multis* to *multo*, by a copyist who did not see that *multis* depended upon *commissa*, is very natural. This reading suits the context much better, if we take *commissa* in sense "entrusted as secrets."

Lucretius v. 753: *A terris altum caput obstruere ei.* Munro takes *altum caput* to be the sun's head, but finds a difficulty in *obstruere*, to which he is obliged to give an unusual sense. If, however, we take *a terris* "on the side of the earth," "from the quarter of the earth," "cf. '*ab occasu*' '*a tergo,*' &c., we shall get rid of this difficulty: *altum caput* will then refer to the moon: "and on the earthward side to raise her head on high in front of him (the sun), opposing an opaque orb," &c.

CANADIAN INSTITUTE.

ANNUAL REPORT FOR THE YEAR 1870–71—Continued from p. 255.

COMMUNICATIONS—*(Continued.)*

25*th February*, 1871.—Rev. Dr. McCaul, "An account of the Roman Legions and Cohorts in Great Britain."

11*th March*, 1871.—J. Loudon, M.A., "On Reciprocal Forces." Dr. Rosebrugh, "On peculiar Optical Defects of the Eye, with illustrative Experiments."

18*th March*, 1871.—Dr. G. Wright, "On Pseudo-membranous Croup."

25*th March*, 1871.—The President, "On Lahontan in connection with Toronto." H. H. Nicholls, Esq., "A Glance at the West Indies and Spanish Main.

1*st April*, 1871.—Dr. Macfarlane, "On the repair of wounds or injuries."

8*th April*, 1871.—Dr. Canniff laid on the table some Indian relics from near Belleville, making some remarks upon points of interest connected with them. Dr. Wilson read a paper "On the peculiarities of the skulls of the Hurons," alluding to and explaining some of the specimens presented by Dr. Canniff.

22*nd April*, 1871.—Dr. Oldright "read some Notes giving the history of a case of emphyema in a child." And also exhibited a portion of the skull of William Carter, who shot himself with a small pistol and fine shot some days ago.

APPENDIX.

DONATION OF BOOKS RECEIVED SINCE LAST REPORT, 30th NOVEMBER, 1870.

Schriften des Vereines sur Virebricting Naturwissenschaftlicher—
Kenntnissein Wein, Bands 2 to 10 9
Nederl. Meteorolog. Jaarbock, 1869 1
Verhandlungen der Kaiserlich Koniglichen Zoologisch-Botanischen Gesellschaft in Wien, Jahrgan, 1870, xx. Band I. and II., Heft 1
" " III., Heft 1
" " IV., Heft 1

From the Chicago Natural History Society—
Transactions of the Wisconsin State Agricultural Society, 1869 1
History of Illinois and Life of Ninian Edwards 1

From New York State Library—
Manual for the use of the Legislature of the State of New York, 1870. By the Secretary of State, 1870 1

From the Board of Commissioners of Public Schools, Baltimore—
Forty-second Annual Report of the Board of Commissioners of Public Schools, year ending December, 31st, 1870.....

From the Hon. J. M. Broadhead, Washington—
Report of the United States Coast Survey Progress, 1867, '68..... 1
United States Patent Office Reports, Vol. 1. 1868, '69..... 1
" " " Vol. 4, " 1

From the Author—
Odd Showers..... 1

From the Author—
Introductory Text Books of Meteorology. By Alex. Buchan, M.A., F.R.S.E. 1

From the Institution—
Smithsonian Contributions to Knowledge..... 1

From His Excellency Major-General Lefroy, R. A.—
Scobie's Almanac, 1848–1853 1
Transactions of the Literary and Historical Society of Quebec, Vol. I..... 1
" " " " Vol. II.... 1

From the Institution—
Proceedings of the Royal Colonial Institute, Vol. I., 1869..... 1

From the United States Patent Office—
United States Patent Office Reports, Vols. 1 to 4..... 4

DONATIONS OF PAMPHLETS FROM 1st DECEMBER, 1870, TO 30th NOVEMBER, 1871.

From the Chamberlain—
Members of the Municipal Council and Civic Officials of the City ot Toronto, from 1834 to 1870, inclusive..... 1

From the Institute—
Peabody Institute Proceedings on the announcement of the death of Hon. John Pendleton Kennedy, Baltimore, 1870..... 1
Second and Third Annual Reports of the Trustees of the Peabody Academy of Science, for the years 1869 and 1870. Salem 1871..... 1
Memoirs of the Peabody Academy of Science, Vol. 1, No. 2. Salem, 1871. 1
Third Annual Report of the Provost to the Trustees, 2nd June, 1870. Baltimore, 1870..... 1
Fourth Annual Report of the Provost to the Trustees 1st June, 1871. Baltimore, 1871..... 1

Per Smithsonian Institution, Washington—
Sitzungs-Berichte der Naturwissenschaftlichen Gesellschaft. Isis in Dresden. Jahrgang, 1870, Januar, Februar and März... 1
Verzeichniss Ausgewählter Werke aus dem Verlage. Von F. C. W. Vogel, in Leipzig, 1870..... 1

Per the Library of the University from the Society—
Memoirs de la Société des Antiquaires du Nord. Nouvelle serie, 1869, Copenhagen..... 1

Royal Society of Northern Antiquaries of Copenhagen 1
Tillaeg til Aarboger for Nordisk Oldkyndighed og Historie Aargang, 1869. Kiobenhavn, 1870 1

From the Society—

List of the Linnean Society, London 1869 1
Additions to the Library of the Society 1
Proceedings of the Linnean Society of London, Session, 1869-'70 2
Journal of the Linnean Society:

Vol. x., Zoology, No. 47, January 17th, 1870 1
" " No. 48, May 20th, 1870 1
Vol. xi., Botany, No. 53, May 10th, 1870 1
" " No. 52, December 30th, 1869 ... 1

By Post—

Catalogue de Livres et Botanique, &c., Amsterdam 1

From the Historical Society of Chicago—

Bulletin of the Wisconsin Academy of Sciences, Arts and Letters, No. 1 .. 1
The last of the Illinois and Sketch of the Potawatomies. By J. D. Cayton. 1
Catalogue of the North-western University, at Evanstown, Illinois, for Academic year 1869-70 1
Catalogue of Officers and Students of Lake Forest Academy, L. F., Illinois, Year 1869-70 1
Annual Report of the Regent, Illinois, Industrial University. March 8th, 1870 1
First Annual Report of the Board of Trustees of the Illinois Industrial University, from their Organization March 12th, 1867, to the close of the Academic year, June, 13th, 1868 1
Second Annual Report ditto, commencing September the 14th, 1868, and ending June 5th, 1869 1
Seventh Annual Report of the Board of Public Works to the Common Council of the City of Chicago, for the Municipal Year ending March 31st, 1868. 1
Eighth Annual ditto, for year ending March, 1869 1
Eleventh Annual Statement of the Trade and Commerce of Chicago for the year ending March 31st, 1869 1
Department of Public Instruction, City of Chicago, 15th Annual Report of the Board of Education, for the year ending July 3rd, 1869 1
Department of Public Instruction, City of Chicago, 16th Annual Report of the Board of Education for the year ending July 1st, 1870 1
Illinois Normal University, 1861-'62 1
" " 1864-'65 1
" " 1865-'66 1
" " 1868-'69 1

From the New York State Library—

Fifty-third Annual Report of the Trustees of the New York State Library. Transmitted to the Legislature, February 9th, 1871 2

From the Author—
Influence of the Blue Color of the Sky in developing Animal and Vegetable Life, by General A. J. Pleasonton 1
From the Author—
Discorso del Comm. Cristoforo Nigri, &c. &c. &c..... 1
From Dawson Bros., Montreal—
The Colonial Question, by the author of "Ginx's Baby," Montreal, 1871... 1
By Mail—
Report of Inquiry. The Colorado Potato Beetle, by W. Saunders and E. B. Reed 1
From the Essex Institute, per Smithsonian Institution—
Bulletin of the Essex Institute, Nos. 1 to 12..... 11
From the Author—
The Sphere, Rights and Obligations of Medical Experts, by James J. O'Dea, of New York, 1871..... 1
From Major-General Lefroy, R.A.—
Transactions of the Literary and Historical Society of Quebec, vol. iv., February, 1843, Part I..... 1
Ditto, vol. iv., January, 1855, Part III..... 1
Catalogue of the Quebec Gallery of Paintings, Engravings, &c., the property of Joseph Légaré 1
From the Institution—
List of Members of the Institution of Civil Engineers, August 8th, 1871 .. 1

RECEIVED IN EXCHANGE FOR "JOURNAL."

Journal of Education, Upper Canada.
Journal of Franklin Institute, Philadelphia.
Journal, Silliman's, New Haven.
Canadian Entomologist.
Nature.
Proceedings of the Antiquaries' Society, Worcester.
Historical Recollections of the Essex Institute.
Proceedings of the Boston Natural History Society.
Anthropological Review.
Canadian Naturalist.
Transactions of the Nova Scotia Institute of Natural Sciences.
Transactions of the Royal Scottish Society of Arts.
Transactions of the Literary and Historical Society of Quebec.
Transactions of the Royal Irish Academy. Vol. 24, Polite Literature, Part IV.; Antiquities, Part VIII.; Science, Parts IX, X, XI, XII, XIII, XIV, XV.
Proceedings of the Philosophical Society of Glasgow, 1867–8, vol. vi, No. 4; 1868–9, vol. vii, No. 1; 1869–70, vol. 7, No. 2.
Proceedings of the Royal Society of Edinburgh, Session 1869–70.
Transactions of the Royal Society of Edinburgh, vol. xxv, Part II, 1868–9; vol. xxvi, Part I, 1859–70.
Proceedings of the Academy of Sciences of Philadelphia.
Journal of the Society of Arts, London.

BOOKS AND PERIODICALS BOUGHT.

Allibone's Dictionary of Authors, vol. iii.
Medical Times and Gazette.
Boston Medical and Surgical Journal.
Fortnightly Review.
Quarterly Journal of Microscopical Science.
Quarterly Journal of the Chemical Society.
The Edinburgh Medical Journal.
The British and Foreign Medical Chirurgical Review.
Quarterly American Journal of Medical Sciences.
Blackwood.
Westminster Review.
Edinburgh Review.
London Quarterly Review.
British Quarterly Review.

DONATIONS FOR THE MUSEUM.

From W. Canniff, Esq., M.D.—
Indian Remains—Pottery..... 15 pieces.
Stone Arrow Heads..... 5 "
Stone Chisels (parts of)..... 5 "
From R. A. Reeve, Esq., M.D.—
Rocks from Mount Washington..... 2 "

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

BY THE REV. DR. SCADDING.

XLVIII.—(*Continued.*)—YONGE STREET—FROM THE SECOND CONCESSION (DEER PARK) TO THE THIRD CONCESSION ROAD.

Fifty years ago, in Canada, English families, whose habits and ideas were more in harmony with Bond Street than with the backwoods, had, in becoming morally acclimatised to the country, a tremendous ordeal to pass through: how they contrived to endure the pains and perils of the process, is now matter of wonder. One of Mr. Jackson's sons, Clifton, is locally remembered as an early example in these parts of the exquisite of the period—the era of the Prince Regent and Lord Byron. By extra-sacrificing to the Graces, at a time when *articles de cosmetique et de luxe* generally were scarce and costly in Canada, he got himself into trouble. Of some of the mishaps that befell him, there is mention made elsewhere in these papers. To distinguish Mr. Mills Jackson from another proprietor on Yonge Street, also called Jackson, the alliterative epithet, "Jacobin," was sometimes applied to him, in jocose allusion to his political principles, held by the official party to be revolutionary. In regard to the other Jackson, some such epithet as "Jacobin" would not have been inapplicable. On the invasion of Canada in 1812 by the United States, he openly avowed his sympathy with the invaders, and was obliged to fly the country. He was known and distinguished as "Hatter Jackson," from the business which he once followed. After the war he returned, and endeavoured, but in vain, to recover possession of the land on Yonge Street which he had temporarily occupied. In the *Gazette*[2] of Nov. 11, 1807, we have Mr. Jackson's advertisement. Almost anticipating the modern "Hats that are Hats," it is headed "Warranted Hats," and then proceeds thus: "The subscriber, having established a hat manufactory in the vicinity of York on a respectable scale, solicits the patronage and support of the public. All orders will be punctually attended to, and a general assortment of warranted hats be continually kept at the store of Mr. Thomas Hamilton in York. Samuel Jackson. Yonge Street, Nov. 10, 1807." An earlier owner of the lot, at which we are now pausing, was Stillwell Wilson. In 1799, at the annual York Township meeting, held on the 4th March in that year at York, we find Stillwell Wilson elected one of the Overseers of Highways and Fenceviewers for the portion of Yonge Street, from lot 26 to lot 40, in Markham and Vaughan. At the same meeting, Paul Wilcot is elected to the same office, "from Big Creek to No. 25, inclusive, and half Big Creek Bridge; and Daniel Dehart, from Big Creek to No. 1, inclusive, and half Big Creek Bridge." The "Big Creek" referred to was, as we suppose, the Don at Hogg's Hollow. In 1821, Stillwell Wilson is landlord of the Waterloo House, in York, and is offering to let that stand; also to let or sell other valuable properties. In the *Gazette* of March 25, 1820, we have his advertisement:—"For sale or to let, four improved farms on Yonge Street, composed of lots Nos. 20 and 30 on the west side, and 15 and 20 on the east side of the street, in the townships of York and Vaughan. These lands are so well known, that they require no further encomiums than the virtues they possess. For title of which please apply to the subscriber at Waterloo House, York, the proprietor of said lands. P. S.—The noted stand known by the name of the Waterloo House, which the subscriber at present possesses, is also offered to be let on easy terms; as also an excellent Sawmill in the third concession of the township of York, east of Yonge Street, only ten miles from town, on the west branch of the river Don. Stillwell Wilson."—In 1828, for moneys due

apparently to Jairus Ashley, some of Stillwell's property has been seized. Under the editorial head of the *Loyalist* of December 27th of that year, we find the following item: "Sheriff's Sale.—At the Court House, in the Town of York, on Saturday, 31st January next, will be sold, Lot No. 30, in the first Concession of the Township of Vaughan, taken in execution as belonging to Stillwell Wilson, at the suit of Jairus Ashley. Sale to commence at 12 o'clock noon." In our paper on the early marine of York, we shall meet with Stillwell Wilson again. We shall then find him in command of a slip-keel schooner plying on the Lake between York and Niagara. The present owner of his lot, which, as we have seen, was also once Mr. Jackson's—Mr. Jacobin Jackson's—is Mr. Cawthra. (Note the tendency to distinguish between individuals bearing the name of Jackson by an epithet prefixed. A professional pugilist patronized by Lord Byron was commonly spoken of as "Gentleman Jackson.")

As we reached again the higher land, after crossing the dam of Whitmore's mill, and returning into the more direct line of the street, some rude pottery works met the eye. Here in the midst of woods, the passer-by usually saw, on one side of the road, a one-horse clay-grinding machine, laboriously in operation; and on the other, displayed in the open air on boards supported by wooden pins driven into the great logs composing the walls of a low windowless building, numerous articles of coarse brown ware, partially glazed,—pans, crocks, jars, jugs demijohns, and so forth; all which primitive products of the plastic art were ever pleasant to contemplate. These works were carried on by Mr. John Walmsley.

A tract of rough country was now reached, difficult to clear and difficult to traverse with a vehicle. Here a genuine corduroy causeway was encountered, a long series of small saw-logs laid side by side, over which wheels jolted deliberately. In the wet season portions of it, being afloat, would undulate under the weight of a passing load; and occasionally a horse's leg would be entrapped, and possibly snapped short by the sudden yielding or revolution of one of the cylinders below. We happen to have a very vivid recollection of the scene presented along this particular section of Yonge Street, when the woods, heavy pine chiefly, after having been felled in a most confused manner, were being consumed by fire, or rather while the effort was being made to consume them. The whole space from near Mr. Walmsley's potteries to the rise beyond which Eglinton is situated, was, and continued long, a chaos of blackened timber, most dismaying to behold. To the right of this tract was one of the Church glebes so curiously reserved in every township in the original laying-out of Upper Canada—one lot of two hundred acres in every seven of the same area—in accordance with a public policy which at the present time seems sufficiently Utopian. Of the arrangement alluded to, now broken up, but expected when the Quebec Act passed in 1780 to be permanent, a relic remained down to a late date in the shape of a wayside inn, on the right near here, styled on its sign the "Glebe Inn"—a title and sign reminding one of the "Church Stiles" and "Church Gates" not uncommon as village ale-house designations in some parts of England.

Hitherto the general direction of Yonge street has been north, sixteen degrees west. At the point where it passes the road marking the northern limit of the third concession from the bay, it swerves seven degrees to the eastward. In the first survey of this region there occurred here a jog or fault in the lines. The portion of the street proposed to be opened north failed, by a few rods, to connect in a continuous right line with the portion of it that led southward into York. The irregularity was afterwards corrected by slicing off a long narrow angular piece from three lots on the east side, and adding the like quantity of land to the opposite lot—it happening just here that the lots on the east side lie east and west, while those on the west side lie north and south. After the third concession, the lots along the street lie uniformly east and west.

XLIX.—YONGE STREET FROM THE THIRD CONCESSION ROAD TO HOGG'S HOLLOW.

With young persons in general perhaps, at York in the olden time, who ever gave the cardinal points a thought, the notion prevailed that Yonge Street was "north." We well remember our own slight perplexity when we first distinctly took notice that the polar star, the dipper, and the focus usually of the northern lights all seemed to be east of Yonge Street. That an impression existed in the popular mind at a late period to the effect that Yonge Street was north, was shown when the pointers indicating east, west, north and south came to be affixed to the apex

of a spire on Gould Street. On that occasion several compasses had to be successively taken up and tried before the workmen could be convinced that "north" was so far "east" as the needle of each instrument would persist in asserting.

The first possessor of the lot on the west side, slightly augmented in the manner just spoken of, was the Baron de Hoen, an officer in one of the German regiments disbanded after the United States Revolutionary war. His name is also inscribed in the early maps on the adjacent lot to the north, known as No. 1 in the township of York, west side. At the time of the capture of York in 1813, Baron de Hoen's house, on Lot No. 1, proved a temporary refuge to some ladies and others, as we learn from a manuscript narrative taken down from the lips of the late venerable Mrs. Breakenridge by her daughter, Mrs. Murney. That record well recalls the period and the scene. "The ladies settled to go out to Baron de Hoen's farm," the narrative says. "He was a great friend," it then explains, "of the Baldwin family, whose real name was Von Hoen; and he had come out about the same time as Mr. St. George, and had been in the British army. He had at this time a farm about four miles up Yonge street, and on a lot called No. 1. Yonge street was then a corduroy road immediately after leaving King Street, and passing through a dense forest. Miss Russell, (sister of the late President Russell) loaded her phaeton with all sorts of necessaries, so that the whole party had to walk. My poor old grandfather (Mr. Baldwin, the father of Mrs. Breakenridge) by long persuasion at length consented to give up fighting, and accompany the ladies. Aunt Baldwin (Mrs. Dr. Baldwin) and her four sons, Major Fuller, who was an invalid under Dr. Baldwin's care, Miss Russell, Miss Willcox, and the whole cavalcade sallied forth: the youngest boy St. George, a mere baby, my mother (Mrs Breakenbridge) carried on her back nearly the whole way. When they had reached about half way out," the narrative proceeds, "they heard a most frightful concussion, and all sat down on logs and stumps, frightened terribly. They learned afterwards that this terrific sound was occasioned by the blowing up of the magazine of York garrison, when five hundred Americans were killed, and at which time my uncle, Dr. Baldwin, was dressing a soldier's wounds; he was conscious of a strange sensation: it was too great to be called a sound, and he found a shower of stones falling all round him, but he was quite unhurt. The family at length reached Baron de Hoen's log house, consisting of two rooms, one above and one below. After three days Miss Russell and my mother walked into town, just in time to prevent Miss Russell's house from being ransacked by the soldiers. All now returned to their homes and occupations," the narrative goes on to say, "except Dr. Baldwin, who continued dressing wounds and acting as surgeon, until the arrival of Dr. Hackett, the surgeon of the 8th Regiment. Dr. Baldwin said it was most touching to see the joy of the poor wounded fellows when told that their own doctor was coming back to them." It is then added: "My mother (Mrs. Breakenridge) saw the poor 8th Grenadiers come into town on the Saturday, and in church on Sunday, with the handsome Captain McNeil at their head, and the next day they were cut to pieces to a man. My father (Mr. Breakenridge) was a student at law with Dr. Baldwin, who had been practising law after giving up medicine as a profession, and had been in his office about three months, when he went off like all the rest to the battle of York." The narrative then gives the further particulars: "The Baldwin family all lived with Miss Russell after this, as she did not like being left alone. When the Americans made their second attack about a month after the first, the gentlemen all concealed themselves, fearing to be taken prisoners like those at Niagara. The ladies received the American officers: some of these were very agreeable men, and were entertained hospitably; two of them were at Miss Russell's; one of whom was a Mr. Brookes, brother-in-law of Archdeacon Stuart, then of York, afterwards of Kingston. General Sheaffe had gone off long before, taking every surgeon with him. On this account Dr. Baldwin was forced, out of humanity, to work at his old profession again, and take care of the wounded."

Lot No. 1 was afterwards the property of an English gentleman, Mr. Harvey Price, a member of our Provincial Government, as Commissioner of Crown Lands, whose conspicuous residence, castellated in character, and approached by a broad avenue of trees, was a little further on. In 1820, No. 1 was being offered for sale in the following terms, in the *Gazette* of March 25th: "That well known farm No. 1, west side of Yonge street, belonging to Captain de Hoen, about four or five miles from York, 210 acres. The land is of excellent quality, well-wooded, with about forty acres cleared, a never failing spring of excellent water, barn and farm house. Application to be made to the subscriber at York.—W. W. Baldwin." Baron de Hoen was second to Mr. Attorney-General White, killed in the duel with Mr. Small in 1800 (January 3rd). In the

contemporary account of that incident in the Niagara *Constellation*, the name is phonetically spelt *De Hayne*, (and in this form we copied it in our section xxvii.) In the above quoted MS. the name appears as de Haine.

In our progress northward we now traverse ground which, as having been the scene of a skirmish and some bloodshed during the troubles of 1837, has become locally historic. The events alluded to have been described from different points of view at sufficient length in books within reach of every one. We throw over them here the mantle of charity, simply glancing at them and passing on. Upper Canada, in miniature and in the space of half a century, curiously passed through conditions and processes, physical and social, which old countries on a large scale and in the course of long ages, passed through. Upper Canada had, in little, its primæval and barbaric but heroic era, its mediæval and high-prerogative era, and then, after a revolutionary period of a few weeks, its modern, defeudalized, democratic era. Without doubt the introduction here in 1792 of an "exact transcript" of the contemporary constitution of the mother country, as was the boast at the time, involved the introduction here also of some of the spirit which animated the official administrators of that constitution in the mother country itself at the period—the time of the Third George. We certainly find from an early date, as we have already heard, a succession of intelligent, observant men, either casual visitors to the country, or else intending settlers and actual settlers, openly expressing dissatisfaction at some of the things which they noted, experienced or learned, in respect of the management of Canadian public affairs. These persons for the most part were themselves perhaps only recently become alive to the changes which were inevitable in the governmental principles of the mother country; and so were peculiarly sensitive, and even, it may be, petulant in regard to such matters. But, however well-meaning and advanced in political wisdom they may have been, they nevertheless, as we have before intimated, exhibited narrowness of view themselves, and some ignorance of mankind, in expecting to find in a remote colonial out-station of the empire a state of things better than that which at the moment existed at the heart of the empire; and in imagining that strictures on their part, especially when acrimonious, would, under the circumstances, be amiably and submissively received by the local authorities. The early rulers of Canada, Upper and Lower, along with the members of their little courts, were not to be lightly censured. They were but copying the example of their royal Chief and his circle at Kew, Windsor, or St. James'. Of the Third George Thackeray says: "He did his best; he worked according to his lights; what virtue he knew he tried to practice; what knowledge he could master he strove to acquire." And so did they. The same fixity of idea in regard to the inherent dignity and power of the Crown that characterized him characterized them, together with a like sterling uprightness which commanded respect even when a line of action was adopted that seemed to tend, and did in reality tend, to popular discontent. All men, however, now acquiesce in the final issue. The social turmoil which for a series of years agitated Canada, from whatever cause arising; the explosion which at length took place, by whatever instrumentality brought on, cleared the political atmosphere of the country, and hastened the good time of general content and prosperity which Canadians of the present day are enjoying. After all, the explosion was not a very tremendous one. Both sides, after the event, have been tempted to exaggerate the circumstances of it a little, for effect.

The recollections which come back to us as we proceed on our way, are for the most part of a date anterior to those associated with 1837; although some of the latter date will of course occasionally recur.

The great conspicuous way-side inn, usually called Montgomery's, was, at the time of its destruction by the Government forces in 1837, in the occupation of a landlord named Lingfoot. The house of Montgomery, from whom the inn took its name, he having been a former occupant, was on a farm owned by himself, beautifully situated on rising ground to the left, subsequently the property and place of abode of Mr. James Lesslie, of whom already (in section xvi). Mr. Montgomery had once had a hotel in York, named "The Bird in Hand," on Yonge Street, a little to the north of Elliott's. We have this inn named in an advertisement to be seen in the *Canadian Freeman* of April 17, 1828, having reference to the "Farmer's Store Company." "A general meeting of the Farmer's Storehouse Company," says the advertisement, "will be held on the 22nd of March next, at 10 o'clock a.m., at John Montgomery's tavern, on Yonge Street, 'The Bird in Hand.' The farmers are hereby also informed that the Storehouse is properly repaired for the accommodation of storage, and that every possible attention shall be paid to

those who shall store produce therein. John Goessman, clerk." The Farmer's Store was at the foot of Nelson Street. Mr. Goessman was a well-known Deputy Provincial Surveyor, of Hanoverian origin. In an address published in the *Weekly Register* of July 15, 1824, on the occasion of his retiring from a contest for a seat in the House as representative for the counties of York and Simcoe, Mr. Goessman alluded as follows to his nationality: "I may properly say," he observed, "that I was a born British subject before a great number of you did even draw breath; and have certainly borne more oppressions during the late French war than any child of this country, that never peeped beyond the boundary even of this continent, where only a small twig of that all-crushing war struck. Our sovereign has not always been powerful enough to defend all his dominions. We, the Hanoverians, have been left the greater part during that contest, to our own fate; we have been crushed to yield our privileges to the subjection of Bonaparte, his greatest antagonist," &c.

Eglinton, through which, at the present day, Yonge Street passes hereabout, is a curious stray memorial of the Tournament in Ayrshire, which made a noise in 1839. The passages of arms on the farther side of the Atlantic that occasionally suggest names for Canadian villages, are not always of so peaceful a character as that in the Earl of Eglinton's grounds in 1839; although it is a matter of some interest now to remember that even in that a Louis Napoleon figured, who at a later period was engaged in jousts of a rather serious kind, promoted by himself.

About Eglinton the name of Snider is notable as that of a United Empire Loyalist family seated here, of German descent. Mr. Martin Snider, father of Jacob and Elias Snider and other brothers and sisters, emigrated hither at an early period from Nova Scotia, where he first took up his abode for a time after the revolution. Among the names of those who volunteered to accompany General Brock to Detroit in 1813 we observe that of Mr. Jacob Snider. In later years, a member of the same family is sheriff for the County of Grey, and repeatedly a representative in Parliament of the same County.

The Anglicised form of the German name Schneider, like the Anglicised form of a number of other non-English names occurring among us, illustrates and represents the working of our Canadian social system; the practical effect of our institutions, educational and municipal. Our mingled population, when permitted to develope itself fairly; when not crushed, or sought to be crushed into narrow alien moulds invented by non-Teutonic men in the pre-printing-press, feudal era, becomes gradually—if not English—at all events Anglo-Canadian, a people of a distinct type on this continent, acknowledged by the grand old mother of nations, Alma Britannia herself, as eminently of kin. We have specially in mind a group from the neighbourhood of Eglinton, genuine sons of our composite Canadian people, Sniders, Mitchells, Jackeses, who, now some years ago, were to be seen twice every day at all seasons, traversing the distance between Eglinton and Toronto, rising early and late taking rest, in order to be punctually present at, and carefully ready for, class-room or lecture-room in town; and this process persevered in for the lengthened period required for a succession of curriculums; with results finally, in a conspicuous degree illustrative of the blending, Anglicising power of our institutions when cordially and loyally used. Similar happy effects springing from similar causes, have we seen in numerous other instances and batches of instances, among the youth of our Western Canada, drawn from widely severed portions of the country.

Beyond Eglinton, in the descent to a rough irregular ravine, the home of Mr. Jonathan Hale was passed on the east side of the street; one of the Hales, who, as we have seen, were forward to undertake works of public utility at a time when appliances for the execution of such works were few. Mr. Hale's lot became afterwards a part of the estate of Jesse Ketchum of whom we have spoken. We add here, that we observe in the *Gazette* of June 11, 1803, an obituary notice of Mr. Ketchum's father. It runs thus: "On Wednesday last, 8th June, departed this life, Mr. Joseph Ketchum, aged 85. His remains were interred the following day."

In 1808, the *Gazette* (October 22) informs us, the sheriff, Miles Macdonell, is about to sell "at Barrett's Inn, in the town of York," the goods and chattels of Henry Hale, at the suit of Elijah Ketchum. Likewise, at the same time, the goods and chattels of Stillwell Wilson, at the suit of James McCormack and others.

On the west side, opposite Mr. Ketchum's land, was a farm that had been modernized and beautified by two families in succession, who migrated hither from the West Indies, the Murrays and the Nantons. In particular, a long avenue of evergreen trees, planted by them and leading

up to the house, was noticeable. While these families were the owners and occupants of this property, it was named by them Pilgrims' Farm. Subsequently Pilgrims' Farm passed into the hands of Mr. James Beaty, one of the representatives of Toronto in the House of Commons in Canada, who made it an occasional summer-retreat, and called it Glen Grove. It had been at one period known as the MacDougal farm, Mr. John MacDougal, of York, having been its owner from 1801 to 1820. Mr. MacDougal was the proprietor of the principal hotel of York. Among the names of those elected to various local offices at the annual Town-meeting held in 1799 at "the city of York," as the report in the *Gazette and Oracle* ambitiously speaks, that of Mr. MacDougal appears under the head of "Overseers of Highways and Roads and Fence-viewers." He and Mr. Clark were elected to act in this capacity for "the district of the city of York." That they did good service we learn from the applause which attended their labours. The leading editorial of the *Gazette and Oracle* of June 29, 1799, thus opens: "The public are much indebted to Mr. John MacDougal, who was appointed one of the pathmasters at the last Town-meeting, for his great assiduity and care in getting the streets cleared of the many and dangerous (especially at night) obstructions thereon; and we hope," the writer says, "by the same good conduct in his successors in the like office, to see the streets of this infant town vie with those of a maturer age, in cleanliness and safety." In the number of the same paper for July 20, (1799), Mr. MacDougal's colleague is eulogized, and thanked in the following terms: "The inhabitants of the west end of this Town return their most cordial thanks to Mr. Clark, pathmaster, for his uncommon exertions and assiduity in removing out of their street its many obstacles, so highly dangerous to the weary traveller." Mr. McDougal was the first grantee of the farm immediately to the south of Glen Grove (lot number three).

On high land to the right, some way off the road, an English-looking mansion of brick with circular ends, was another early innovation. A young plantation of trees so placed as to shelter it from the north-east winds, added to its English aspect. This was Kingsland, the home of Mr. Huson, likewise an immigrant from the West Indies. It was afterwards the abode of Mr. Vance, an Alderman of Toronto. One or two old farm houses of an antique New Jersey style, of two storeys, with steepish roofs and small windows, were then passed on the left. Some way further on, but still in the low land of the irregular ravine, another primitive rustic manufactory of that article of prime necessity, leather, was reached. This was "Lawrence's Tannery." A bridge over the stream here, which is a feeder to the Don, was sometimes spoken of as Hawke's bridge, from the name of its builder. In the hollow on the left, close to the Tannery, and overlooked from the road, was a cream-coloured respectable frame-house, the domicile of Mr. Lawrence himself. In his yard or garden, some hives of bees, when such things were rarities, used always to be looked at with curiosity in passing.

The original patentees of lots six, seven, eight and nine, on the west side of the street just here, were four brothers, Joseph, Duke, Hiram and John Kendrick, respectively. They all had nautical proclivities; or, as one who knew them said, they were, all of them, "water-dogs;" and we shall hear of them again in our chapter on the early marine of York harbour. In 1799, Duke Kendrick was about to establish a potashery on number seven. His advertisement appears in the *Gazette*, of December 21, 1799. It is headed "Ashes! Ashes! Ashes!" The announcement then follows: "The subscriber begs leave to inform the public that he is about to erect a Pot-ash upon lot No. 7, west side of Yonge Street, where he will give a generous price for ashes; for house-ashes, ninepence per bushel; for field-ashes, sixpence, delivered at the Pot-ash." It is then added: "He conceives it his duty to inform those who may have ashes to dispose of, that it will not be in his power to pay cash, but merchandize at cash price. Duke W. Kendrick. York, Dec. 7, 1799." In the year following, Mr. Allan advertises for ashes to be delivered at pot-ash works in York. In the *Gazette* for November 29, 1800, we have: "Ashes wanted. Sevenpence Halifax currency per bushel for house-ashes will be given, delivered at the Pot-ash works, opposite the Gaol; and fivepence same currency, if taken from the houses; also, eightpence New York currency for field-ashes delivered at the works. W. Allan. York, 21st November [1800]."

We now speedily arrived at the commencement of the difficult descent into the valley of the great west branch of the Don. Yonge Street here made a grand detour to the east, and failed to regain the direct northerly course for some time. As usual, wherever long inclined planes were cut in the steep sides of lofty clay banks, the condition of the roadway hereabout was, after rain, indescribably bad. After reaching the stream and crossing it on a rough timber

bridge, known anciently sometimes as Big Creek bridge and sometimes as Heron's bridge, the track ascended the further bank, at first by means of a narrow hogsback, which conveniently sloped down to the vale; afterwards it made a sweep to the northward along the brow of some broken hills, and then finally turned westward until the direct northern route of the street was again touched. The banks of the Don are here on every side very bold, divided in some places into two stages by an intervening plateau. On a secondary flat thus formed, in the midst of a grass-grown clearing to the left, as the traveller journeyed from York, there was erected at an early date the shell of a place of worship appertaining to the old Scottish Kirk, put up here through the zeal of Mr. James Hogg, a member of that communion, and the owner, for a time at least, of the flour mills in the valley, near the bridge. From him this locality was popularly known as Hogg's Hollow, despite the postal name of the place, York Mills. Mr. Hogg was of Scottish descent and a man of spirit. He sent a cartel in due form in 1832 to Mr. Gurnett, editor of the *Courier*. An article in that paper had spoken in offensive terms of supposed attempts on the part of a committee in York to swell the bulk of a local public meeting, by inviting into town persons from the rural parts. "Every wheel of their well-organized political machine was set in motion," the *Courier* asserted, "to transmute country farmers into citizens of York. Accordingly about nine in the morning, groups of tall, broad-shouldered, hulking fellows were seen arriving from Whitby, Pickering and Scarborough, some crowded in waggons, and others on horseback; and Hogg, the miller, headed a herd of the swine of Yonge Street, who made just as good votes at the meeting as the best shopkeepers in York." No hostile encounter, however, took place, although a burlesque account of an "affair of honour" was published, in which it was pretended that Mr. Hogg was saved from a mortal wound by a fortunate accumulation, under the lapel of his coat, of flour, in which his antagonist's bullet buried itself Mr. Hogg died in 1839. Here is an extract from the sermon preached by the Rev. Mr. Leach on the occasion of his funeral: "He was faithful to his word and promise," the preacher said, "and when surrounded with danger and strongly investigated, and tempted to a departure from public faith by the enemies of his country, his determination expressed in his own words, was, 'I will die a Briton.' Few men had all the veins of nature more clearly and strongly developed; and few men had a better sense of what is due to God."

The circuit of the hills overhanging the mills below was always tedious; but several good bits of scenery were caught sight of. On the upland, after escaping the chief difficulties, on the left hand a long low wooden building was seen, with gable and door towards the road. This was an early place of worship of the Church of England, an out-post of the mission at York. The long line of its roof was slightly curved downwards by the weight of a short chimney built at its middle point for the accommodation of an iron stove within. Just before arriving at the gate of the burying-ground attached to this building, there were interesting glimpses to the left down into deep woody glens, all of them converging southward on the Don. In some of them were little patches of pleasant grass land. But along here, for the most part, the forest long remained undisturbed. The church or chapel referred to was often served by divinity students sent out from town; and frequently, doubtless, had its walls echoed with prentice-attempts at pulpit oratory. Gourlay says that this chapel and the Friends' Meeting House near Newmarket were the only two places of public worship on Yonge Street in 1817, "a distance of nearly forty miles." A notice of it is inserted in "A Visit to the Province of Upper Canada in 1819, by James Strachan," (the Bishop's brother)—a work published at Aberdeen in 1820. "My brother," Mr. Strachan says, p. 141, "had, by his exertions and encouragement among the people, caused a chapel to be built about eight miles from York, where he officiates once a month, one of the young students under his care reading the service and a sermon on the intermediate Sundays. On his day of doing duty," Mr. S. continues, "I went with him and was highly gratified. The chapel is built in a thick wood. . . . . The dimensions are 60 by 30 feet; the pews are very decent, and what was much better, they were filled with an attentive congregation. As you see very few inhabitants on your way out, I could not conceive where all the people came from." A public baptism of five adults is then described. Some six and twenty years later (in 1843), the foundation stone of a durable brick church was laid near the site of the old frame chapel. On that occasion Dr. Strachan, now Bishop Strachan, named as especial promoters of the original place of worship, Mr. Seneca Ketchum and Mr. Joseph Sheppard, "the former devoting much time and money in the furtherance of the work, and the latter giving three acres of land as a site, together with a handsome donation in cash."

A silver medal which had been deposited under the old building was now transferred to a cavity in the foundation stone of its proposed successor. It bore on the obverse, "Francis Gore, Esq., Lieutenant-Governor, 1816," and on the reverse "Fifty-sixth of George Third." To it were now added a couple of other medals of silver: one bore on the obverse, "John Strachan, D.D., Bishop of Toronto; Alexander Sanson, Minister, 1843;" on the reverse, "Sixth of Victoria." The other had inscribed on it the name of the architect, Mr. J. G. Howard, with a list of other churches erected in Upper Canada under his direction. Among the persons present during the ceremony were Chief Justice Robinson, Vice-Chancellor Jameson, the Hon. and Rev. A. Cavendish, and the Rev. G. Mortimer, of Thornhill. Prior to the out-door proceedings a remarkable scene had been witnessed within the walls of the old building. Four gentlemen received the rite of Confirmation at the hands of the Bishop, all of them up to a recent date, non-conformists; three of them non-conformist ministers of mark, Mr. Townley, Mr. Leach (whom we heard just now pronouncing a eulogy on Mr. Hogg,) and Mr. Ritchie; the fourth, Mr. Sanson, not previously a minister, but now in Holy Orders of the Church of England, and the minister appointed to officiate in the new church.

At the present day Yonge Street crosses Hogg's Hollow in a direct line on a raised embankment which the ancient Roman roadmakers would have deemed respectable—a work accomplished about the year 1835, before the aid of steam power was procurable in these parts for such purposes. Mr. Lynn was the engineer in charge here, at that time. The picturesque character of the valley has been considerably interfered with. Nevertheless a winding road over the hills to the right leading up to the church (St. John's) has still some sylvan surroundings. In truth, were a building or two of the châlet type visible, the passer-by might fancy himself for a moment in an upland of the High Alps, so Swiss-like is the general aspect. It may be added that the destruction of the beautiful hereabout has to some extent a set-off in the fine geological studies displayed to the eye in the sides of the deep cuts at both ends of the great causeway. Lake Ontario's ancient floor here lifted up high and dry in the air, exhibits stratum super stratum, the deposits of successive periods long ago. (The action of the weather, however, has at the present time greatly blurred the interesting pictures of the past formerly displayed on the surface of the artificial escarpments at Hogg's Hollow.)

L.—YONGE STREET, FROM HOGG'S HOLLOW TO THORNHILL.

Beyond the Hollow, Mr. Humberstone's was passed on the west side, another manufacturer of useful pottery ware. A curious incident used to be narrated as having occurred in this house. The barrel of an old Indian fowling piece turned up by the plough in one of the fields, and made to do duty in the management of unwieldly back logs in the great fire-place, suddenly proved itself to have been charged all the while, by exploding one day in the hands of Mr. Humberstone's daughter while being put to its customary use, and killing her on the spot. (Somewhat similarly, at Fort Erie, we have been told, in the fire which destroyed the wharf at the landing, a condemned cannon which had long been planted in the pier as a post, went off, happily straight upwards, without doing any damage.) Mr. Humberstone saw active service as a lieutenant in the incorporated militia in 1812. He was put in charge of some of the prisoners captured by Col. Fitzgibbon, at the Beaver Dams, and when now nearing his destination, Kingston, with his prisoners in a large batteau, he, like the famous Dragoon who caught the Tartar, was made a prisoner of himself by the men whom he had in custody, and was adroitly rowed over by them to the United States shore, where being landed he was swiftly locked up in jail, and thence only delivered when peace was restored.

The next memorable object, also on the left, was Shephard's inn, a noted resting place for wayfarers and their animals, flanked on the north by large driving sheds, on the south by stables and barns: over the porch, at an early period, was the effigy of a lion gardant, attempted in wood on the premises. Constructiveness was one of the predominant faculties in the first landlord of the Golden Lion. He was noted also for skilful execution on several instruments of music: on the bassoon for one. In the rear of the hotel, a little to the south, on a fine eminence, he put up for himself after the lapse of some years, a private residence, remarkable for the originality of its design, the outline of its many projecting roofs presenting a multitude of concave curves in the Chinese pagoda style. In several buildings in this neighbourhood an effort was at one time made, chiefly, we believe, through the influence of Mr. Shep-

hard, to reproduce what in the west of England are called cobwalls; but either from an error in compounding the material, or from the peculiar character of the local climate, they proved unsatisfactory. The Sheppards, early proprietors of land a little further on, were a different family and spelt their name differently. It was some members of this family that were momentarily concerned in the movement of 1837.

In Willowdale, a hamlet just beyond Shephard's, was the residence of Mr. David Gibson, destroyed in 1837 by the Government forces. We observe in the *Gazette* of January 6th, 1826, the announcement, "Government House, York, 29th December, 1825. His Excellency the Lieutenant-Governor has been pleased to appoint David Gibson, gentleman, to be a surveyor of land in the Province." In the practice of the profession indicated he was prosperous, and also as a practical farmer. He likewise represented North York in the Provincial Parliament. When the calm came after the tumult of 1837, he was appointed one of the Superintendents of Colonization Roads. He died at Quebec in 1864.

A road turning off at right angles to the eastward out of Willowdale led to a celebrated camp meeting ground, on the property of Mr. Jacob Cummer, one of the early German settlers. It was in a grand maple forest—a fine specimen of such trysting places. It was here that we were for the first time present at one of the peculiar assemblies referred to, which, over the whole of this northern continent, in a primitive condition of society at its several points, have fulfilled, and still fulfil, an important, and we doubt not, beneficent function. This, as we suppose, was the scene of the camp meeting described in Peter Jones' Autobiography. "About noon," he writes on Tuesday, the 10th of June, 1828, "started for the camp ground. When we arrived we found about three hundred Indians collected from Lake Simcoe and Scugog Lake. Most of those from Lake Simcoe have just come in from the back lakes to join with their converted brethren in the service of the Almighty God. They came in company with brother Law, and all seemed very glad to see us, giving us a hearty shake of the hand. The camp ground enclosed about two acres, which was surrounded with board tents, having one large gate for teams to go in and out, and three smaller ones. The Indians occupied one large tent, which was 220 feet long and 15 feet broad. It was covered overhead with boards, and the sides were made tight with lathes to make it secure from any encroachments. It had four doors fronting the camp ground. In this long house the Indians arranged themselves in families, as is their custom in their wigwams. Divine service commenced towards evening. Elder Case first gave directions as to the order to be observed on the camp ground during the meetings. Brother James Richardson then preached from Acts ii. 21; after which I gave the substance in Indian, when the brethren appeared much affected and interested. Prayer-meeting in the evening. The watch kept the place illuminated during the night." The meeting continued for four days.

Where the dividing line occurs between York and Markham, at the angle on the right was the first site of the sign of the Green Bush, removed afterwards, as we have noted, to the immediate outskirts of York; and to the left, somewhere near by, was a sign that used to interest from its peculiarity, the Durweston Gate: a small white five-barred gate, hung by its topmost bar to a projection from a lofty post, and having painted on its lower bars "Durweston Gate," and the landlord's name. It was probably a reproduction by a Dorsetshire immigrant of a familiar object in his native village.

Not excluding from our notes, as will be observed, those places where Shenstone sighed to think a man often "found the warmest welcome," we must not forget Finch's—a great hostelry on the right, which we soon reached as we advanced northward, of high repute about 1836, and subsequently, among excursion parties from town, and among the half-pay settlers of the Lake Simcoe region, for the contents of its larder and the quality of its cooking. Another place of similar renown was Crew's, six or eight miles further on. When for long years, men—especially Englishmen, called by their occasions away from their homes, had been almost everywhere doomed to partake of fare too literally hard, and perilous to the health, it is not to be wondered at, when, here and there, at last a house for the accommodation of the public did spring up where, with cleanly quarters, digestible viands were to be had, that its fame should speedily spread; for is it not Dr. Samuel Johnson himself who has, perhaps rather sweepingly said, "there is nothing which has yet been contrived by man by which so much happiness is produced, as by a good tavern or inn."

Where a long slope towards the north begins soon after Finch's, a village entitled Dundurn was once projected by Mr. Allan McNab, afterwards the famous Sir Allan, acting, we believe,

at the time as agent for Mr. H. J. Boulton; but Dundurn never advanced beyond incipience. The name was afterwards familiar as that of Sir Allan's château close by Hamilton.

A well-travelled road now soon turned off to the right leading to certain, almost historic, mills in Markham, known as the German Mills. In the *Gazetteer* of 1799 these mills are referred to. "Markham township in the east riding of the County of York fronts Yonge Street," it is stated in that early work, "and lies to the northward of York and Scarborough. Here" it then adds "are good mills and a thriving settlement of Germans." The German Mills were situated on lot No. 4 in the third concession, on a portion of the Rouge or Nen—a river which the same *Gazetteer* informed its readers was "the back communication from the German settlement in Markham to Lake Ontario." The expectation in 1799 was, as the *Gazetteer* further shows, that this river, and not either the Humber or the Don, would one day be connected with the Holland river by a canal. It was not certainly known in 1794, where the river which passed the German Mills had its outlet. In Iredell's plan of Markham of that date, the stream is marked "Kitche-seepe or Great River," with a memorandum attached—"waters supposed to empty into Lake Ontario to the eastward of the Highlands of York." Information, doubtless, noted down, by Iredell, from the lips of some stray native. Kitche-seepe, "Big River" is of course simply a descriptive expression, taken as in so many instances, by the early people, to be a proper name. (It does not appear that among the aborigines there were any proper local names, in our sense of the expression.) The German Mills were founded by Mr. Berczy, either on his own account or acting as agent for an association at New York for the promotion of German emigration to Canada. When, after failing to induce the Government to reconsider its decision in regard to the patents demanded by him for his settlers, that gentleman retired to Montreal the German Mills with various parcels of land were advertised for sale in the *Gazette* of April 27, 1805, in the following strain: "Mills and land in Markham. To be sold by the subscriber for payment of debts due to the creditors of William Berczy, Esq., the mills called the German Mills, being a grist mill and a saw mill. The grist mill has a pair of French burs, and complete machinery for making and bolting superfine flour. These mills are situated on lot No. 4 in the third concession of Markham; with them will be given in, lots No. 3 and 4 in the third concession, at the option of the purchaser. Also 300, acres being the west half of lot No. 31, and the whole of lot 32 in the second concession of Markham. Half the purchase money to be paid in hand, and half in one year with legal interest W. Allan. N.B.—Francis Smith, who lives on lot No. 14 in the third concession, will show the premises. York, 11th March, 1805." It appears from the same *Gazette* that Mr. Berczy's vacant house in York had been entered by burglars after his departure. A reward of twenty dollars is offered for their discovery. "Whereas," the advertisement runs, "the house of William Berczy, Esq., was broken open sometime during the night of the 14th instant, and the same ransacked from one end to the other; this is to give notice that whoever shall lodge an information, so that the offender or offenders may be brought to justice, shall upon conviction thereof, receive Twenty Dollars. W. Chewett. York, 18th April, 1805." We have before referred to Mr. Berczy's embarrassments, from which he never became disentangled; and to his death in New York in 1813. His decease was thus noticed in a Boston paper, quoted by Dr. Canniff, p. 364, "Died—In the early part of the year 1813, William Berczy, Esq., aged 68; a distinguished inhabitant of Upper Canada, and highly respected for his literary acquirements. In the decease of this gentleman, society must sustain an irreparable loss, and the republic of letters will have cause to mourn the death of a man eminent for genius and talent."

The German Mills were purchased and kept in operation by Capt. Nolan, of the 70th Regiment, at the time on duty in Canada; but the speculation was not a success. We have heard it stated that this Capt. Nolan was the father of the officer of the same name and rank who fell in the charge of the Light Brigade at the very first outset, when, at Balaclava,

> "Into the valley of Death
> Rode the six hundred."

The *Gazette* of March 19, 1818, contains the following curt announcement: "Notice. The German Mills and Distillery are now in operation. For the Proprietors. Alexander Patterson, Clerk. 11th March, 1818." Ten years later they are offered for sale or to lease in the *U. C. Loyalist* of April 5, 1828. (It will be observed that they once bore the designation of Nolanville.) "For sale or to be leased," thus runs the advertisement, "all or any part of the

property known and described as Nolanville or German Mills, in the third concession of the township of Markham, consisting of four hundred acres of land, upwards of fifty under good fences and improvements, with a good dwelling-house, barn, stable, saw-mill, grist-mill, distillery, brew-house, malt-house, and several other out-buildings. The above premises will be disposed of, either the whole or in part, by application to the subscriber, William Allan, York, January 26, 1828. The premises can be viewed at any time by applying to Mr. John Duggan residing there."

In the absence of striking architectural objects in the country at the time, we remember, about the year 1828, thinking the extensive cluster of buildings constituting the German Mills a rather impressive sight, coming upon them suddenly, in the midst of the woods, in a deserted condition, with all their windows boarded up.

One of our own associations with the German Mills is the memory of Mr. Charles Stewart Murray, afterwards well-known in York as connected with the Bank of Upper Canada. He had been thrown out of employment by Capt. Nolan's relinquishment of the Mills. He was then patronized by Mr. Thorne of Thornhill. In our boyish fancy, a romantic interest attached to Mr. Murray from his being a personal friend of Sir Walter Scott's, and from his being intimately associated with him in the excursion to the Orkneys, while the Pirate and the Lord of the Isles were simmering in the Novelist's brain. "Not a bad Re-past," playfully said Sir Walter after partaking one day of homely meat-pie at the little inn of one Rae. Lo! from Mr. Murray's talk, a minute grain to be added to Sir Walter's already huge cairn of *ana*. Mr. M., too, was imagined by us, quite absurdly doubtless, to be an hereditary devotee of the Pretender, if not closely allied to him by blood. (His grandfather, or other near relative, had, we believe, really been for a time secretary to Prince Charles Edward Stuart.)

A mile or two beyond where the track to the German Mills turned off, Yonge Street once more encountered a branch of the Don, flowing, as usual, through a wide and difficult ravine. At the point where the stream was crossed, mills and manufactories made their appearance at an early date. The ascent of the bank towards the north was accomplished, in this instance, in no round-about way. The road went straight up. Horse-power and the strength of leather were here often severely tested. On the rise above began the village of Thornhill, an attractive and noticeable place from the first moment of its existence. Hereabout several English families had settled, giving a special tone to the neighbourhood. In the very heart of the village was the home, unfailingly genial and hospitable, of Mr. Parsons, one of the chief founders of the settlement; emigrating hither from Sherborne in Dorsetshire in 1820. Nearer the brow of the hill overlooking the Don, was the house of Mr. Thorne, from whom the place took its name: an English gentleman also from Dorsetshire, and associated with Mr. Parsons in the numerous business enterprises which made Thornhill for a long period a centre of great activity and prosperity. Beyond, a little further northward, lived the Gappers, another family initiating here the amenities and ways of good old west-of-England households. Dr. Paget was likewise an element of happy influence in the little world of this region, a man of high culture; formerly a medical practitioner of great repute in Torquay. Another character of mark associated with Thornhill in its palmy days was the Rev. George Mortimer, for a series of years the pastor of the English congregation there. Had his lot been cast in the scenes of an Oberlin's labours or a Lavater's, or a Felix Neff's, his name would probably have been conspicuously classed with theirs in religious annals. He was eminently of their type. Constitutionally of a spiritual temperament, he still did not take theology to be a bar to a scientific and accurate examination of things visible. He deemed it "sad, if not actually censurable, to pass blindfolded through the works of God, to live in a world of flowers, and stars, and sunsets, and a thousand glorious objects of Nature, and never to have a passing interest awakened by any one of them." Before his emigration to Canada he had been curate of Madeley in Shropshire, the parish of the celebrated Fletcher of Madeley, whose singularly beautiful character that of Mr. Mortimer resembled. Though of feeble frame his ministerial labours were without intermission; and his lot, as Fletcher's also, was to die almost in the act of officiating in his profession.—An earlier incumbent of the English Church at Thornhill was the Rev. Isaac Fidler. This gentleman rendered famous the scene of his Canadian ministry, as well as his experiences in the United States, by a book which in its day was a good deal read. It was entitled "Observations on Professions, Literature, Manners, and Emigration in the United States and Canada." Although he indulged in some sharp strictures on the citizens of the

United States, in relation to the matters indicated, and followed speedily after by the never-to-be-forgotten Mrs. Trollope, his work was reprinted by the Harpers. Mr. Fidler was a remarkable person,—of a tall Westmoreland mould, resembling the common pictures of Wordsworth. He was somewhat peculiar in his dress, wearing always an extremely high shirt-collar, very conspicuous round the whole of his neck, forming a kind of spreading white socket in which rested and revolved a head, bald, egg-shaped and spectacled. Besides being scholarly in the modern sense, Mr. Fidler possessed the more uncommon accomplishment of a familiarity with the oriental languages. The notices in his book of early colonial life have now to us an archaic sound. We give his narrative of the overturn of a family party on their way home from church. "The difficulty of descending a steep hill in wet weather may be imagined," he says. "The heavy rains had made it (the descent south of Thornhill) a complete puddle which afforded no sure footing to man or beast. In returning from church, the ladies and gentlemen I speak of," he continues, "had this steep hill to descend. The jaunting-car being filled with people was too heavy to be kept back, and pressed hard upon the horses. The intended youthful bridegroom (of one of the ladies) was, I was told, the charioteer. His utmost skill was ineffectually tried to prevent a general overturn. The horses became less manageable every moment. But yet the ladies and gentlemen in the vehicle were inapprehensive of danger, and their mirth and jocularity betrayed the inward pleasure they derived from his increasing struggles. At last the horses, impatient of control, and finding themselves their own masters, jerked the carriage against the parapet of the road and disengaged themselves from it. The carriage instantly turned over on its side; and as instantly all the ladies and gentlemen trundled out of it like rolling pins. Nobody was hurt in the least, for the mire was so deep that they fell very soft and were quite imbedded in it. What apologies the gentleman made I am unable to tell, but the mirth was perfectly suspended. I overtook the party at the bottom of the hill, the ladies walking homewards from the church and making no very elegant appearance."—As an example of the previously undreamt-of incidents that may happen to a missionary in a backwoods settlement, we mention what occurred to ourselves when taking the duty one fine bright summer morn, many years ago, in the Thornhill Church, yet in its primitive unenlarged state. A farmer's horse that had been mooning leisurely about an adjoining field, suddenly took a fancy to the shady interior disclosed by the wide opened doors of the sacred building. Before the churchwardens or any one else could make out what the clatter meant, the creature was well up the central passage of the nave. There becoming affrighted, its ejection was an awkward affair, calling for tact and manœuvring.

The English Church at Thornhill has had another incumbent not undistinguished in literature, the Rev. E. H. Dewar, author of a work published at Oxford in 1844, on the Theology of Modern Germany. It is in the form of letters to a friend, written from the standpoint of the Jeremy Taylor school. It is entitled "German Protestantism and the Right of Private Judgment in the Interpretation of Holy Scripture." The author's former position as chaplain to the British residents at Hamburg gave him facilities for becoming acquainted with the state of German theology. Mr. Dewar, to superior natural talents, added a refined scholarship and a wide range of accurate knowledge. He died at Thornhill in 1862. The incumbent who preceded Mr. Dewar was the Rev. Dominic E. Blake, brother of Mr. Chancellor Blake; a clergyman also of superior talents. Previous to his emigration to Canada in 1832, he had been a curate in the county of Mayo. He died suddenly in 1859. It is remarked of him in a contemporary obituary that "his productions indicated that while intellect was in exercise his heart felt the importance of the subjects before him." These productions were numerous, in the form of valuable papers and reports, read or presented to the local Diocesan Society.

It is curious to observe that in 1798, salmon ascended the waters of the Don to this point on Yonge Street. Among the recommendations of a farm about to be offered for sale, the existence thereon of "an excellent salmon fishery" is named. Thus runs the advertisement (*Gazette*, May 16, 1798): "To be sold by public auction, on Monday, the 2nd of July next, at John McDougall's hotel, in the town of York, a valuable Farm, situated on Yonge Street, about twelve miles from York, on which are a good log house, and seven or eight acres well improved. The advantages of the above farm, from the richness of its soil and its being well watered, are not equalled by many farms in the Province; and above all, it affords an excellent salmon fishery, large enough to support a number of families, which must be conceived a great advantage in this infant country. The terms will be made known on the day of sale."

LI.—YONGE STREET FROM THORNHILL TO RICHMOND HILL.

As we move on from Thornhill with Vaughan on the left and Markham on the right, the name of another rather memorable early missionary recurs, whose memory is associated with both these townships—Vincent Philip Mayerhoffer. Notwithstanding its drawbacks, early Canadian life, like early American life generally, became, in a little while, invested with a curious interest and charm; by means, for one thing, of the variety of character encountered. A man might vegetate long in an obscure village or country town of the old mother country before he rubbed against a person of V. P. Mayerhoffer's singular experience, and having his wits set in motion by a sympathetic realization of such a career as his. He was a Hungarian; born at Raab in 1784; and had been ordained a presbyter in the National Church of Austria. On emigrating to the United States, he being himself a Franciscan, fell into some disputes with the Jesuits at Philadelphia, and withdrew from the Latin communion and attached himself, in company with a fellow-presbyter named Huber, to the Lutheran Reformed. As a recognized minister of that body he came on to Buffalo, where he officiated for four years to three congregations, visiting at the same time, occasionally, a congregation on the Canada side of the river, at Limeridge. He here, for the first time, began the study of the English language. Coming now into contact with the clergy of the Anglican communion, he finally resolved to conform to the Anglican Church, and was sent by bishop Stewart, of Quebec, to the German settlement in Markham and Vaughan. Here he officiated for twenty years, building in that interval S. Stephen's Church in Vaughan, S. Philip's in the 3rd concession of Markham, and the Church in Markham village, and establishing a permanent congregation at each. He was a vigorous, stirring preacher in his acquired English tongue, as well as in his vernacular German. He possessed also a colloquial knowledge of Latin, which is still a spoken language in part of Hungary. He was a man of energy to the last: ever cheerful in spirit, and abounding in anecdotes, personal or otherwise, the scenes of which the generality of persons about him were little acquainted with. It was from him, as we remember, we first heard the afterwards more familiarized names of Magyar and Sclave. His brother-clergy of the region where his duty lay were indebted to him for many curious glimpses at men and things in the great outer world of the continent of Europe. During the Napoleonic wars he was "Field Chaplain of the Imperial Infantry Regiment, No. 60 of the Line," and accompanied the Austrian contingent of 40,000 men furnished to Napoleon by the Emperor of Austria. He was afterwards, when the Austrian Emperor broke away from Napoleon, taken prisoner with five regiments of the line, and sent to Dresden and Mayence. He was at the latter place when the battle of Leipsic was fought (Oct. 16, 17, 18, 19, 1813.) He now left Mayence without leave, the plague breaking out there, and got to Oppenheim, where a German presbyter called Muller concealed him, till the departure of the French out of the town. After several adventures he found his way back to the quarters of his regiment now acting in the anti-French interest at Manheim, where he duly reported himself and was well received. After the war, from the year 1816, he had for three years the pastoral charge of Klingenmünster in the diocese of Strasbourg. He died in Whitby in 1859. A memoir of Mr. Mayerhoffer has been printed, and it bears the following title: "Twelve years a Roman Catholic Priest; or, The Autobiography of the Rev. V. P. Mayerhoffer, M.A., late Military Chaplain to the Austrian Army and Grand Chaplain of the Orders of Free Masons and Orangemen of Canada, B. N. A., containing an account of his career as Military Chaplain, Monk of the Order of St. Francis, and Clergyman of the Church of England in Vaughan, Markham and Whitby, C. W." He had a musical voice which had been properly cultivated. This, he used to say, was a source of revenue to him in the early part of his public career, those clergy being in request and receiving a higher remuneration, who were able to sing the service in a superior manner. His features were strongly marked and peculiar, perhaps Mongolian in type; they were not German, English or Italian. Were the concavity of the nose and the projection of the mouth a little more pronounced in "Elias Howe," the medallions of that personage would give a general idea of Mr. Mayerhoffer's profile and head. In his younger days he had acquired some medical knowledge, which stood him in good stead for a time at Philadelphia, when he and Huber first renounced the Latin dogmas. His taste for the healing art was slightly indulged even after the removal to Canada, as will be seen from an advertisement which appears in the *Courier* of February 29, 1832. (From its wording it will be observed that Mayerhoffer had not yet become familiarized with the English language.) It is

headed thus: "The use and direction of the new-invented and never-failing Wonder Salve, by D. V. P. Mayerhoffer, of Markham, U.C., H.D., 5th concession." It then proceeds: "Amongst all in the medicine-invented unguents his salve takes the first place for remedy, whereby not in vain obtains the name of Wonder Salve for experience taught in many cases to deserve this name; and being urged to communicate it to the public, I endeavour to satisfy to the common good of the public. It is acknowledged by all who know the virtue of it, and experienced its worth, it ought to be kept in every house, first for its inestimable goodness, and, second, because the medicine the older it gets the better it is: money spent for such will show its effect from its beginning for twenty years, if kept in a dry place, well covered. In all instances of burns, old wounds, called running sores, for the tetter-worm or ring, &c., as the discussions and use will declare, wrapped round the box or the medicine. It is unnecessary to recommend by words this inestimable medicine, as its value has received the approbation of many inhabitants of this country already, who sign their names below for the surety of its virtue and the reality of its worth, declaring that they never wish to be without it in their houses by their lifetimes. In Markham, Mr. Philip Eckhardt, jun., do. do., sen., Godlieb Eckhardt, Abraham Eckhardt, John Pingel, jun., Mr. Lang, Mr. Large, John Perkins, John Schall, Charles Peterson, Luke Stantenkough, Peter March. In Vaughan, Jacob Fricher, Daniel Stang. Recommended by Dr. Baldwin, of York. The medicine is to be had in the eighth concession of Markham, called Riarstown, by Sinclair Holden; in the 5th concession, by Christopher Hevelin and T. Amos; in the town of York, in J. Baldwin's and S. Barnham's stores; on Yonge Street, by Parsons and Thorne. Price of a box, two shillings and sixpence, currency. January 11, 1832."

Military associations hang about the lands to the right and left of Richmond Hill. The original possessor of Lot No. 22 on the west side, was Capt. Daniel Cozens, a gentleman who took a very active part in opposition to the revolutionary movement which resulted in the independence of the United States. He raised, at his own expense, a company of native soldiers in the royalist interest, and suffered the confiscation of a considerable estate in New Jersey. Three thousand acres in Upper Canada were subsequently granted him by the British Crown. His sons, Daniel and Shivers, also received grants. The name of Shivers Cozens is to be seen in the early plans of Markham on lots 2, 4 and 5 in the 6th concession. Samuel died of a fit at York in 1808; but Shivers returned to New Jersey and died there, where family connexions of Capt. Cozens still survive. There runs amongst them a tradition that Capt. Cozens built the first house in our Canadian York. Of this we were informed by Mr. T. Cottrill Clarke, of Philadelphia, who has taken a friendly interest in notices which he has chanced to see of these papers. We observe in an early plan of York the name of Shivers Cozens on No. 23 in Block E, on the south side of King Street: the name of Benjamin Cozens on No. 5 on Market Street: and the name of Capt. Daniel Cozens on No. 4 King Street (New Town) north side, with the date of the grants, July 20, 1799. It is thus quite likely that Capt. Cozens or a member of his family put up buildings in York at a very early period. We read in the Niagara *Herald*, of Oct. 31, 1801, the following: "Died on the 6th ult., near Philadelphia, Capt. Daniel Cozens.' In the *Gazette & Oracle*, of January 27, 1808, we have a memorandum of the decease of Samuel Cozens: "Departed this life, on the 29th ult., Mr. Samuel D. Cozens, one of the first inhabitants of this town [York]. His remains were interred with Masonic honours on the 31st."

Another officer of the Revolutionary era was the first owner, and for several years the actual occupant, of the lot immediately opposite Capt. Cozens'. This was Capt. Richard Lippincott, a native of New Jersey. A bold deed of his has found a record in all the histories of the period. The narrative gives us a glimpse of some of the painful scenes attendant on wars wherein near relatives and old friends come to be set in array one against the other. On the 12th of April, 1782, Capt. Lippincott, acting under the authority of the "Board of Associated Loyalists of New York," executed by hanging, on the heights near Middleton, Joshua Huddy, an officer in the revolutionary army, as an act of retaliation,—Huddy having summarily treated, in the same way, a relative of Capt. Lippincott's, Philip White, surprised within the lines of the revolutionary force, while on a stolen visit of natural affection to his mother on Christmas Day. On Huddy's breast was fastened a paper containing the following written notice, to be read by his co-revolutionists and friends when they should discover the body suspended in the air.—"We, the Refugees, having long with grief beheld the cruel murders of our brethren, and finding nothing but such measures carrying into execution, therefore determined not to suffer

without taking vengeance for the numerous cruelties; and thus begin, having made use of Captain Huddy as the first object to present to your view; and further determine to hang man for man, while there is a Refugee existing. Up goes Huddy for Philip White!" When the surrender of Capt. Lippincott was refused by the Royalist authorities, Washington ordered the execution of one officer of equal rank to be selected by lot out of the prisoners in his hands. The lot fell on Capt. Charles Asgill of the Guards, aged only nineteen. He was respited however until the issue of a court-martial, promised to be held on Capt. Lippincott, should be known. The court acquitted; and Captain Asgill only narrowly escaped the fate of Andre, through prompt intervention on the part of the French Government. The French minister in London, the Count de Vergennes, to whom there had been time for Lady Asgill, the captain's mother, to appeal—received directions to ask his release in the conjoint names of the King and Queen as "a tribute to humanity." Washington thought proper to accede to this request; but it was not until the following year, when the revolutionary struggle ended, that Asgill and Lippincott were set at liberty. The former lived to succeed to his father's baronetcy and to become a General officer. Colonel O'Hara, of Toronto, remembered dining at a table where a General Sir Charles Asgill was pointed out to him as having been, during the American revolutionary war, for a year under sentence of death, condemned by General Washington to be hanged in the place of another person.

Capt. Lippincott received from the Crown three thousand acres in Upper Canada. He survived until the year 1826, when, aged 81, and after enjoying half-pay for a period of forty-three years, he expired at the house of his son-in-law in York, Colonel George Taylor Denison, who gave to his own eldest son, Richard Lippincott Denison, Captain Lippincott's name.

In connexion with Richmond Hill, which now partially covers the fronts of Captain Cozens' and Captain Lippincott's lots, we subjoin what Captain Bonnycastle said of the condition of Yonge Street hereabout in 1846, in his "Canada and the Canadians." "Behold us at Richmond Hill," he exclaims, "having safely passed the Slough of Despond which the vaunted Yonge Street mud road presents between the celebrated hamlet of St. Albans and the aforesaid hill." And again: "We reached Richmond Hill, seventeen miles from the Landing, at about 8 o'clock (ɯɐɯ ǝɥ moving southward) having made a better day's journey than is usually accomplished on a road which will be macadamized some fine day;—for the Board of Works," he proceeds to inform the reader, "have a Polish engineer hard at work surveying it; of course, no Canadian was to be found equal to this intricate piece of engineering; and I saw a variety of sticks stuck up; but what they meant I cannot guess at. I suppose they were going to grade it, which is the favourite American term." The prejudices of the Englishman and Royal Engineer routinier here betray themselves. The Polish engineer, who was commencing operations on this subdivision of Yonge Street, was Mr. Casimir Stanislaus Gzowski, whose subsequent Canadian career renders it probable that in setting up "the variety of sticks," the meaning of which Capt. Bonnycastle does after all guess at, he understood his business. We are assured that this portion of Yonge Street was in fact conspicuous for the superior excellence of its finish. Captain Bonnycastle indulges in a further little fling at civilians who presume to undertake engineering duties, in a story which serves to fill a page or two of his book, immediately after the above remarks on Yonge Street, about Richmond Hill. He narrates an incident of his voyage out:—"A Character," he says, "set out from England to try his fortune in Canada. He was conversing about prospects in that country, on board the vessel, with a person who knew him, but whom he knew not. 'I have not quite made up my mind,' said the character, 'as to what pursuit I shall follow in Canada; but that which brings most grist to the mill will answer best; and I hear a man may turn his hand to anything there, without the folly of an apprenticeship being necessary; for if he have only brains, bread will come; now what do you think would be the best business for my market?' 'Why,' said the gentleman, after pondering a little, 'I should advise you to try civil engineering; for they are getting up a Board of Works there, and want that branch of industry very much, for they won't take natives: nothing but foreigners and strangers will go down.' 'What is a civil engineer?' said the Character. 'A man always measuring and calculating,' responded his adviser, 'and that will just suit you.' 'So it will,' rejoined Character, and a civil engineer he became accordingly, and a very good one into the bargain, for he had brains, and had used a yard measure all his lifetime." Who "the Character" was, we do not for certain know.

LII.—YONGE STREET FROM RICHMOND HILL TO BOND'S LAKE.

A short distance beyond Richmond Hill was the abode of Colonel Moodie, on the right, distinguished by a flag-staff in front of it, after the custom of Lower Canada, where an officer's house used to be known in this way. (In the neighbourhood of Sorel, as we remember, in the winter of 1837, it was one of the symptoms of disaffection come to a head, when in front of a substantial habitan's home a flag-staff was suddenly seen bearing the inscription "—— ——, Capitaine, élu par le peuple.") Colonel Moodie's title came from his rank in the regular army. He had been Lieut.-Colonel of the 104th regiment. Sad that a distinguished officer, after escaping the perils of the Peninsular war and of the war with the United States, here in 1812–13, should have yet, nevertheless, met with a violent death in a petty local civil tumult. He was shot, as all remember, in the troubles of 1837, while attempting to ride past Montgomery's, regardless of the insurgent challenge to stop.

> "Thou might'st have dreamed of brighter hours to close thy chequered life
> Beneath thy country's victor-flag, sure beacon in the strife;
> Or in the shadow of thy home with those who mourn thee now,
> To whisper comfort in thine ear, to calm thine aged brow.
> Well! peaceful be thy changeless rest,—thine is a soldier's grave:
> Hearts like thine own shall mourn thy doom—meet requiem for the brave—
> And ne'er 'till Freedom's ray is pale and Valour's pulse grown cold
> Shall be thy bright career forgot, thy gloomy fate untold."

So sang one in the columns of a local contemporary paper, in "Lines suggested by the Lamented Death of the late Colonel Moodie."

At a certain period in the history of Yonge Street, as indeed of all the other leading thoroughfares of Upper Canada, about 1830–33, a frequent sign that property had changed hands, and that a second wave of population was rolling in, was the springing up, at intervals, of houses of an improved style, with surroundings, lawns, sheltering plantations, winding drives, well-constructed entrance-gates, and so on, indicating an appreciation of the elegant and the comfortable. We recall two instances of this, which we used to contemplate with particular interest, a little way beyond Richmond Hill, on the left: the cosy, English-looking residences, not far apart, with a cluster of appurtenances round each—of Mr. Larratt Smith, and Mr. Francis Boyd. Both gentlemen settled here with their families in 1836. Mr. Smith had been previously in Canada in a military capacity during the war of 1812–13, and for many years subsequently he had been Chief Commissary of the Field Train Department and Paymaster of the Artillery. He died at Southampton in 1860. Mr. Boyd, who emigrated hither from the county of Kent, was one of the first, in these parts, to import from England improved breeds of cattle. In his house was to be seen a collection of really fine paintings, amongst them a Holbein, a Teniers, a Domenichino, a Smirke, a Wilkie, and two Horace Vernets. The families of Mr. Boyd and Mr. Smith were related by marriage. Mr. Boyd died in Toronto in 1861.

Beyond Mr. Boyd's, a solitary house, on the same side of Yonge Street, lying back near the woods, used to be eyed askance in passing:—its occupant and proprietor, Mr. Kinnear, had in 1843 been murdered therein by his man-servant, assisted by a female domestic. It was imagined by them that a considerable sum of money had just been brought to the house by Mr. Kinnear. Both criminals would probably have escaped justice had not Mr. F. C. Capreol, of Toronto, on the spur of the moment, and purely from a sense of duty to the public, undertaken their capture, which he cleverly effected at Lewiston in the United States.

The land now began to be somewhat broken as we ascended the rough and long-uncultivated region known as the Oak Ridges. The predominant tree in the primitive forest here was the pine, which attained a gigantic size; but specimens of the black oak were intermingled. Down in one of the numerous clefts and chasms which were to be seen in this locality, in a woody dell on the right, was Bond's Lake, a pretty crescent-shaped sheet of water. We have the surrounding property offered for sale in a Gazette of 1805, in the following terms: "For Sale: lots No. 62 and 63, in the first concession of the township of Whitchurch, on the east side of Yonge Street, containing 380 acres of land: a deed in fee simple will be given by the subscriber to any person inclined to purchase. Johnson Butler. N.B. The above lots include the whole of the Pond commonly called Bond's Lake, the house and clearing round the same. For particulars inquire of Mr. R. Ferguson and Mr. T. B. Gough at York, and the subscriber at Niagara. March 23, 1805."

Bond's farm and lake had their name from Mr. William Bond, who so early as 1800 had established in York a Nursery Garden, and introduced there most of the useful fruits. In 1801 Mr. Bond was devising to sell his York property, as appears from a quaint advertisement in a Gazette of that year. He therein professes to offer his lot in York as a free gift; the recipient however being at the same time required to do certain things. "To be given away," he says, "that beautifully situated lot No. one, fronting on Ontario and Duchess Streets: the buildings thereon are—a small two-and-a-half storey house, with a gallery in front, which commands a view of the lake and the bay: in the cellar a never-failing spring of fine water; and a stream of fine water running through one corner of the lot; there is a good kitchen in the rear of the house, and a stable sufficient for two cows and two horses, and the lot is in good fence. The conditions are, with the person or persons who accept of the above present, that he, she or they purchase not less than two thousand apple-trees at three shillings, New York currency, each; after which will be added, as a further present, about one hundred apple, thirty peach, and fourteen cherry trees, besides wild plums, wild cherries, English gooseberries, white and red currants, &c. There are forty of the above apple trees, as also the peach and cherry trees, planted regular, as an orchard, much of which appeared in blossom last spring, and must be considered very valuable: also as a kitchen garden, will sufficiently recommend itself to those who may please to view it.—The above are well calculated for a professional or independent gentleman; being somewhat retired—about half-way from the Lake to the late Attorney General's and opposite the town-farm of the Hon. D. W. Smith [afterwards Mr. Allan's property.] Payment will be made easy; a good deed; and possession given any time from the first of November to the first of May next. For further particulars inquire of the subscriber on the premises. William Bond. York, Sep. 4, 1801."—The price expected was, as will be made out, 750 dollars. The property was evidently the northern portion of what became afterwards the homestead-plot of Mr. Surveyor-General Ridout. It would appear that Mr. Bond's property did not find a purchaser on this occasion. In 1804 he is advertising it again, but now to be sold by auction, with his right and title to the lot on Yonge Street. In the *Gazette* of August 4, 1804, we read as follows: "To be sold by auction, at Cooper's tavern in York, on Monday, the twentieth day of August next, at eleven o'clock in the forenoon (if not previously disposed of by private contract), that highly cultivated lot opposite the Printing Office [Bennett's] containing one acre, together with a nursery thereon of about ten thousand apple, three hundred peach, and twenty pear trees, and an orchard containing forty-one apple trees fit for bearing, twenty-seven of which are full of fruit; thirty peach and nine cherry trees full of fruit; besides black and red plums, red and white currants, English gooseberries, lilacs, rose bushes, &c., &c., also a very rich kitchen garden.—The buildings are a two-and-a-half storey house, a good cellar, stable and smokehouse. On the lot is a never-failing spring of excellent water, and a fine creek running through one corner most part of the year. The above premises might be made very commodious for a gentleman at a small expense; or for a tanner, brewer, or distiller must be allowed the most convenient place in York. A view of the premises (by any person or persons desirous of purchasing the same) will be sufficient recommendation. The nursery is in such a state of forwardness that if sold in from two to three years (at which time the apple trees will be fit to transplant) at the moderate price of one shilling each, would repay a sum double of that asked for the whole, and leave a further gain to the purchasers of the lot, buildings, and flourishing orchard thereon. A good title to the above, and possession given any time after the first of October next. Also at the same time and place the right as per Register, to one hundred acres in front of lot 62, east side Yonge Street, for which a deed can be procured at pleasure, and the remainder of the lot procured for a small sum. It is an excellent soil for orchard, grain and pasture land. There is a field of ten acres in fence besides other clearing. It is a beautiful situation, having part of the Lake commonly called Bond's Lake, within the said lot, which affords a great supply of Fish and Fowl. Terms of payment will be made known on the day of sale. For further particulars enquire of the subscriber on the former premises, or the printer hereof. William Bond. York, 27th June, 1804."

Thirty years later we meet with an advertisement in which the price is named at which Lot No. 63 could have been secured. Improvements expected speedily to be made on Yonge Street are therein referred to. In a Gazette of 1834 we have: "A delightful situation on Yonge Street, commonly called Bond's Farm, containing 190 acres, beautifully situated on Bond's Lake upon Yonge Street, distant about 16 miles from the city of Toronto: price £950. The picturesque

beauty of this lot," the advertisement says, "and its proximity to the flourishing capital of Upper Canada, make it a most desirable situation for a gentleman of taste. The stage-coaches between Toronto and Holland Landing and Newmarket pass the place daily; and there appears every prospect of Yonge Street either having a railroad or being macadamized very shortly. Apply (if by letter free of postage) to Robert Ferrie, at Hamilton, the proprietor."

In the advertisement of 1805, given above, Bond's Lake is styled a pond. The small lakes in these hills seemed, of course, to those who had become familiarized with the great lakes, simply ponds. The term "lake" applied to Ontario, Huron, and the rest has given a very inadequate idea of the magnitude and appearance of those vast expanses, to externs who imagine them to be picturesque sheets of water somewhat exceeding in size, but resembling, Windermere, Loch Lomond, or possibly Lake Leman. "Sea" would have conveyed a juster notion: not however to the German, who styles the lakes of Switzerland and the Tyrol, "seas."

Bond's Lake inn, the way-side stopping place in the vale where Yonge Street skirts the lake, used to be, in an especial degree, of the old-country cast, in its appliances, its fare, its parlours and other rooms.

LIII.—YONGE STREET FROM BOND'S LAKE TO THE SUMMIT OF THE RIDGES.

We now speedily passed Drynoch, lying off to the left, on elevated land, the abode of Capt. Martin McLeod, formerly of the Isle of Skye. The family and domestic group systematized on a large scale at Drynoch here, was a Canadian reproduction of a chieftain's household. Capt. McLeod was a Scot of the Norse vikinger type, of robust manly frame, of noble, frank, and tender spirit; an Ossianist too, and, in the Scandinavian direction, a philologist. Sir Walter Scott would have made a study of Capt. McLeod, and may have done so. He was one of eight brothers who all held commissions in the army. His own military life extended from 1808 to 1832. As an officer successively of the 27th, the 79th and the 25th regiments, he saw much active service. He accompanied the force sent over to this continent in the war of 1812–13. It was then that he for the first time saw the land which was to be his final home. He was present likewise at the affair of Plattsburg: and also, we believe, at the attack on New Orleans. He afterwards took part in the so-called Peninsular war, and received a medal with four clasps for Toulouse, Orthes, Nive, and Nivelle. He missed Waterloo, "unfortunately," as he used to say; but he was present with the allied troops in Paris during the occupation of that city in 1815. Of the 25th regiment he was for many years adjutant; and then paymaster. Three of his uncles were general officers. It is not inappropriate to add that the Major McLeod who received the honour of a Companionship in the Order of St. Michael and St. George for distinguished service in the Red River Expedition of 1870, was a son of Captain McLeod, of Drynoch.

That in and about the Canadian Drynoch Gaelic should be familiarly heard was in keeping with the general character of the place. The ancient Celtic tongue was in fact a necessity, as among the dependants of the house there were always some who had never learned the English language. Drynoch was the name of the old home in Skye. The Skye Drynoch was an unfenced, hilly pasture farm of about ten miles in extent, yielding nutriment to herds of wild cattle and some 8,000 sheep. Within its limits a lake, Loch Brochadale, is still the haunt of the otter which is hunted by the aid of the famous terriers of the island; a mountain stream abounds with salmon and trout; while the heather and bracken of the slopes shelter grouse and other game.

Whittaker, in his *History of Whalley*, quoted by Hallam in his *Middle Ages*, describes the aspect which, as he supposes, a certain portion of England presented to the eye, as seen from the top of Pendle Hill in Yorkshire, in the Saxon times. The picture which he draws we in Canada can realize with great perfectness. "Could a curious observer of the present day," he says, "carry himself nine or ten centuries back, and ranging the summit of Pendle, survey the forked vale of Calder on one side and the bolder margins of Ribble and Hodder on the other, instead of populous towns and villages, the castles, the old tower-built house, the elegant modern mansion, the artificial plantation, the enclosed park and pleasure-ground, instead of uninterrupted enclosures which have driven sterility almost to the summit of the fells, how great then must have been the contrast, when, ranging either at a distance, or immediately beneath, his eye must have caught vast tracts of forest-ground stagnating with bog or darkened by native woods, where the wild ox, the roe, the stag, and the wolf, had scarcely learned the

supremacy of man, when, directing his view to the intermediate spaces, to the winding of the valleys, or the expanse of plains beneath, he could only have distinguished a few insulated patches of culture, each encircling a village of wretched cabins, among which would still be remarked one rude mansion of wood, scarcely equal in comfort to a modern cottage, yet there rising proudly eminent above the rest, where the Saxon lord, surrounded by his faithful cotarii, enjoyed a rude and solitary independence, having no superior but his sovereign." This writer asks us to carry ourselves nine or ten centuries back, to realize the picture which he has conceived. From the upland here in the vicinity of Drynoch, less than half a century ago, gazing southwards over the expanse thence to be commanded, we should have beheld a scene closely resembling that which, as he supposed, was seen from the summit of Pendle in the Saxon days; while, at the present day, we see everywhere throughout the same expanse, an approximation to the old mother-lands, England, Ireland, and Scotland, in condition and appearance: in its style of agriculture, and the character of its towns, villages, hamlets, farm houses, and country villas.

We now entered a region once occupied by a number of French military refugees. During the Revolution in France, at the close of the last century, many of the devotees of the royalist cause passed over into England, where, as elsewhere, they were known and spoken of as *emigrés*. Amongst them were numerous officers of the regular army, all of them, of course, of the noblesse-order, or else, as the inherited rule was, no commission in the king's service could have been theirs. When now the royal cause became desperate, and they had suffered the loss of all their worldly goods, the British Government of the day, in its sympathy for the monarchical cause in France, offered them grants of land in the newly-organized province of Upper Canada. Some of them availed themselves of the generosity of the British Crown. Having been comrades in arms they desired to occupy a block of contiguous lots. Whilst there was yet almost all Western Canada to choose from, by some chance these Oak Ridges, especially difficult to bring under cultivation and somewhat sterile when subdued, were preferred, partly perhaps through the influence of sentiment; they may have discovered some resemblance to regions familiar to themselves in their native land. Or in a mood inspired and made fashionable by Rousseau they may have longed for a lodge in some vast wilderness "where the mortal coil" which had crushed the old society of Europe should no longer harass them. When twitted by the passing wayfarer who had selected land in a more propitious situation, they would point to the gigantic boles of the surrounding pines in proof of the intrinsic excellence of the soil below, which must be good, they said, to nourish such a vegetation. After all, however, this particular locality may have been selected rather for them, than by them. On the early map of 1798 a range of nine lots on each side of Yonge Street, just here in the Ridges, is bracketed and marked, "French Royalists: by order of his Honor," i.e., the President, Peter Russell. A postscript to the *Gazetteer* of 1799 gives the reader the information that "lands have been appropriated in the rear of York as a refuge for some French Royalists, and their settlement has commenced." On the Vaughan side, No. 56 was occupied conjointly by Michel Saigeon and Francis Reneoux; No. 57 by Julien le Bugle; No. 58 by Rénè Aug. Comte de Chalûs, Amboise de Farcy and Quetton St. George conjointly; No. 59 by Quetton St. George; No. 60 by Jean Louis Vicomte des Chalûs. In King, No. 61 by Rénè Aug. Comte de Chalûs and Augustin Boiton conjointly. On the Markham side: No. 52 is occupied by the Comte de Puisaye; No. 53 by Rénè Aug. Comte de Chalûs; No. 54 by Jean Louis Vicomte de Chalûs and Rénè Aug. Comte de Chalûs conjointly; No. 55 by Jean Louis Vicomte de Chalûs; No. 56 by le Chevalier de Marseuil and Michel Fauchard conjointly; No. 57 by the Chev. de Marseuil; No. 58 by Rénè Létourneaux, Augustin Boiton and J. L. Vicomte de Chalûs conjointly; No. 59 by Quetton St. George and Jean Furon conjointly; No. 60 by Amboise de Farcy. In Whitchurch, No. 61 by Michel Saigeon

After felling the trees in a few acres of their respective allotments, some of these èmigrés withdrew from the country. Hence in the Ridges was to be seen here and there the rather unusual sight of abandoned clearings returning to a state of nature.

The officers styled Comte and Vicomte de Chalûs derived their title from the veritable domain and castle of Chalûs in Normandy, associated in the minds of all young readers of English History with the death of Richard Cœur de Lion. Jean Louis de Chalûs, whose name appears on numbers 54 and 55 in Markham and on other lots, was a Major-General in the Royal Army of Brittany. At the balls given by the Governor and others at York, the jewels of Madame la

Comtesse created a great sensation, wholly surpassing everything of the kind that had hitherto been seen by the ladies of Upper Canada. Amboise de Farcy of No. 58 in Vaughan and No. 60 in Markham had also the rank of General. Augustin Boiton of No. 58 in Markham and No. 61 in Vaughan was a Lieutenant-Colonel. The Comte de Puisaye of No. 52 in Markham figures conspicuously in the contemporary accounts of the royalist struggle against the Convention. He himself published in London in 1803 five octavo volumes of Memoirs, justificatory of his proceedings in that contest. Carlyle in his "French Revolution" speaks of de Puisaye's work, and, referring to the so-called Calvados war, says that those who are curious in such matters may read therein "how our Girondin National forces, i.e., the Moderates, marching off with plenty of wind-music, were drawn out about the old Chateau of Brécourt, in the wood-country near Vernon (in Brittany), to meet the Mountain National forces (the Communist) advancing from Paris. How on the fifteenth afternoon of July, 1793, they did meet:—and, as it were, shrieked mutually, and took mutually to flight, without loss. How Puisaye thereafter,—for the Mountain Nationals fled first, and we thought ourselves the victors,—was roused from his warm bed in the Castle of Brécourt and had to gallop without boots; our Nationals in the night-watches having fallen unexpectedly into *sauve qui peut.*" Carlyle alludes again to this misadventure, when approaching the subject of the Quiberon Expedition, two years later, towards the close of the La Vendée war. Affecting for the moment a prophetic tone, in his peculiar way, Carlyle proceeds thus, introducing at the close of his sketch, de Puisaye, once more, who was in command of the invading force spoken of, although not individedly so "In the month of July, 1795, English ships," he says, "will ride in Quiberon roads. There will be debarkation of chivalrous Ci-devants, (i.e. ex-noblesse), of volunteer Prisoners-of-war—eager to desert; of fire-arms, Proclamations, clothes-chests, Royalists and specie. Whereupon also, on the Republican side, there will be rapid stand-to-arms; with ambuscade-marchings by Quiberon beach, at midnight; storming of Fort Penthièvre; war-thunder mingling with the roar of the mighty main; and such a morning light as has seldom dawned: debarkation hurled back into its boats, or into the devouring billows, with wreck and wail;—in one word, a Ci-devant Puisaye as totally ineffectual here as he was at Calvados, when he rode from Vernon Castle without boots."

The impression which Carlyle gives of M. de Puisaye is not greatly bettered by what de Lamartine says of him in the *History of the Girondists*, when speaking of him in connexion with the affair near the Chateau of Brécourt. He is there ranked with adventurers rather than heroes. "This man," de Lamartine says, "was at once an orator, a diplomatist, and a soldier,—a character eminently adapted for civil war, which produces more adventurers than heroes." De Lamartine describes how, prior to the repulse at Chateau Brécourt, "M. de Puisaye had passed a whole year concealed in a cavern in the midst of the forests of Brittany, where, by his manœuvres and correspondence, he kindled the fire of revolt against the republic." He professed to act in the interest of the moderates, believing that, through his influence, they would at last be induced to espouse heartily the cause of constitutional royalty. Thiers in his "History of the French Revolution," vii. 146, speaks in respectful terms of Puisaye. He says that "with great intelligence and extraordinary skill in uniting the elements of a party, he combined extreme activity of body and mind, and vast ambition:" and even after Quiberon, Thiers says "it was certain that Puisaye had done all that lay in his power." De Puisaye ended his days in England, in the neighbourhood of London, in 1827. In one of the letters of Mr. Surveyor Jones we observe some of the improvements of the Oak Ridges spoken of as "Puisaye's Town."

It is possibly to the settlement, then only in contemplation, of emigrés here in the Oak Ridges of Yonge Street, that Burke alludes, when in his Reflections on the French Revolution he says: "I hear that there are considerable emigrations from France, and that many, quitting that voluptuous climate and that seductive Circean liberty, have taken refuge in the frozen regions, and under the British despotism, of Canada." "The frozen regions of Canada," the great rhetorician's expression in this place, has become a stereotyped phrase with declaimers. The reports of the first settlers at Tadoussac and Quebec made an indelible impression on the European mind. To this day, in transatlantic communities, it is realized only to a limited extent that Canada has a spring, summer and autumn as well as a winter, and that her skies wear an aspect not always gloomy and inhospitable. "British despotism" is, of course, ironically said, and means, in reality, British constitutional freedom.

(To be continued)

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—JULY, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	MEAN		6 A.M.	2 P.M.	10 P.M	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result	MEAN		
					°	°	°	°	°																		
1	29.591	29.487	29.495	29.5235	73.7	93.2	73.7	80.80	+14.48	.707	.626	.707	.675	85	40	85	68	Calm.	W	Calm.	N 90 W	0.0	20.6	0.0	7.08	7.28	...	...
2	.502	.515	.458	.4890	75.2	88.1	73.7	80.22	+13.72	.686	.728	.646	.680	79	54	78	67	W	S	Calm.	N 83 W	3.0	6.0	0.0	1.62	2.97	...	...
3	.457	.352	.372	.3901	71.5	82.4	72.3	76.25	+ 9.55	.616	.559	.664	.628	80	51	84	71	Calm.	S W	Calm.	S 49 W	0.0	16.0	0.0	4.55	5.17	0.050	...
4	.390	.382	.484	.4218	67.9	75.9	66.1	69.57	+ 2.65	.603	.692	.449	.567	88	77	70	77	Calm.	S W	N W	S 78 W	0.0	3.0	1.5	0.47	1.89	Inap.	...
5	.559	.607	.685	.6200	59.6	71.2	62.1	64.93	— 2.13	.352	.437	.356	.371	69	57	63	61	W	N W	Calm.	N 67 W	4.9	5.7	0.0	3.00	4.68	...	...
6	.727	.701	.716	.7128	60.7	78.0	65.8	69.55	+ 2.30	.387	.412	.391	.409	73	43	62	58	N W	S	N W	S 31 W	1.0	8.6	7.0	2.63	3.90	...	...
7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S	N	S 45 E	0.0	8.5	4.0	0.85	2.32	Inap.	...
8	.771	.756	.717	.7427	64.7	77.7	66.8	71.17	+ 3.63	.430	.429	.428	.445	70	45	65	59	Calm.	S E	N E	S 68 E	0.0	2.5	3.8	1.68	2.72	...	...
9	.705	.655	.590	.6427	63.2	78.4	68.0	71.28	+ 3.62	.438	.612	.580	.561	76	53	83	73	S E	E	Calm.	S 81 E	1.0	4.2	0.0	1.39	1.89	...	...
10	.571	.512	.552	.5472	68.6	73.0	69.7	71.09	+ 5.82	.654	.731	.669	.677	94	90	92	88	Calm.	N E	W	S 25 W	0.0	7.2	0.4	0.28	2.01	.720	...
11	.573	.514	.475	.5143	66.1	82.0	67.9	72.50	+ 4.60	.598	.694	.590	.626	93	63	86	79	Calm.	S E	Calm.	S 4 W	0.0	5.0	0.0	1.33	1.55	...	...
12	.473	.406	.537	.4742	67.2	83.1	73.0	75.57	+ 7.57	.599	.720	.535	.641	90	65	66	73	Calm.	S	N	N 47 W	0.0	2.6	4.4	1.78	3.73	Inap.	...
13	.655	.685	.642	.6607	66.1	69.4	64.7	67.03	— 1.05	.412	.417	.430	.411	64	58	70	62	N E	E	N E	N 84 E	0.3	9.3	0.4	4.02	4.79	...	...
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	S	Calm.	S 43 E	3.4	7.0	0.0	0.86	2.05	...	...
15	.528	.432	.382	.4388	66.1	83.8	71.9	75.20	+ 6.95	.480	.720	.596	.633	75	62	76	73	Calm.	S E	S	S 30 E	0.0	3.8	1.3	1.14	1.53	...	...
16	.362	.327	.354	.3478	71.9	83.1	73.0	75.87	+ 7.58	.716	.849	.731	.758	92	75	90	85	Calm.	S	N	S 12 W	0.0	2.8	2.2	1.65	2.05	.490	...
17	.409	.444	.494	.4543	70.5	83.4	74.4	76.77	+ 8.42	.688	.592	.530	.597	92	52	62	66	W	S	N	N 48 W	11.4	5.8	6.5	0.86	2.48	...	...
18	.510	.512	.578	.5295	67.9	79.8	66.8	71.49	+ 3.02	.455	.476	.307	.402	67	46	47	54	N W	N W	N W	N 28 W	1.3	2.8	16.8	6.38	6.53	Inap	...
19	.632	.645	.647	.6415	58.2	74.8	59.3	65.23	— 3.18	.314	.260	.394	.323	64	30	78	55	N W	N W	Calm.	N 35 W	9.4	11.5	0.0	6.22	6.47	...	...
20	.683	.602	.545	.6010	60.0	78.8	66.5	69.38	+ 0.95	.407	.475	.456	.450	79	48	70	65	Calm.	S	Calm.	S 7 W	0.0	10.4	0.0	2.80	2.93	...	...
21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S W	N W	N 52 W	0.0	2.4	6.6	1.83	2.65	.440	...
22	.495	.574	.615	.5652	60.4	73.3	61.8	66.13	— 2.33	.414	.341	.396	.379	78	42	71	51	N W	N	Calm.	N 24 W	8.4	13.6	0.0	7.58	7.63	...	...
23	.612	.543	.489	.5433	58.2	66.1	58.2	62.40	— 6.05	.394	.546	.419	.442	81	85	87	78	Calm.	Calm.	N W	S 70 W	0.0	0.0	3.7	0.19	0.83	...	...
24	.554	.567	.658	.5987	60.4	74.4	64.3	66.60	— 1.85	.463	.338	.375	.390	88	40	63	62	N W	N W	N W	N 64 W	2.0	14.2	1.0	4.85	5.80	...	...
25	.701	.672	.552	.6295	59.3	76.6	66.9	67.22	— 1.20	.394	.313	.507	.413	78	34	77	64	Calm.	S	Calm.	S 13 W	0.0	1.3	0.0	0.63	0.69	...	...
26	.406	.359	.559	.4525	61.4	75.9	60.0	65.88	— 2.48	.488	.426	.419	.450	89	47	81	72	Calm.	N W	W	N 57 W	0.0	31.0	0.8	9.55	10.37	.002	...
27	.618	.597	.618	.6102	61.4	73.3	63.2	66.77	— 1.60	.438	.503	.451	.462	80	61	78	72	N W	Calm.	Calm.	S 83 W	0.6	0.0	0.0	0.72	1.77	...	...
28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S W	Calm.	S 34 W	0.0	12.2	0.0	3.91	4.00	...	...
29	.595	.549	.632	.5917	62.5	68.3	65.1	66.13	— 2.10	.460	.681	.543	.540	81	88	88	84	Calm.	E	N W	N 15 W	0.0	2.6	7.4	0.95	1.47	.580	...
30	.714	.700	.629	.6793	61.4	70.5	63.6	65.65	— 2.55	.438	.354	.360	.386	80	48	61	62	N	S E	N E	N 35 E	8.0	8.0	4.0	2.87	4.43	Inap	...
31	.574	.567	.565	.5665	60.4	66.5	59.3	63.08	— 5.05	.367	.419	.321	.369	70	64	64	64	E	E	Calm.	N 90 E	0.5	9.0	0.0	1.58	1.7	.010	..
	29.5691	29.5430	29.5570	29,5591	64.61	77.07	66.62	70.16	+ 2.25	.496	.529	.491	.507	80	57	74	69	...	...	...	.....	1.78	7.66	2.32	.....	3.56	2.297	.....

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JULY, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.774 at 8 a.m. on 8th } Monthly range
Lowe t Barometer.....29.317 at 4 p.m on 10th } 0.457.

Self-registering Ther.
- Maximum Temperature.....93°0 on 1st } Monthly range
- Minimum Temperature.....52°2 on 23rd } 43°8.
- Mean Maximum Temperature.....80°67 } Mean daily range
- Mean Minimum Temperature.....59°61 } 21°06.
- Greatest daily range.....29°0 from a.m. to p.m. of 1st.
- Least daily range.....10°6 from noon to midnight of 13th.

Warmest Day..... 1st ... Mean Temperature.....80°80 }
Coldest Day.....23rd ... Mean Temperature.....62°40 } Difference=24°51.

Maximum Radiation { Solar.....151°0 on 3rd } Monthly range
Terrestrial.....39°0 on 19th } 110°6.

Aurora observed on 8 nights, viz., 5th, 7th, 8th, 10th, 16th, 27th, 28th, and 29th.

Possible to see Aurora on 25 nights; impossible on 6 nights.

Raining on 13 days; depth 2.297 inches; duration of fall 15.4 hours.

Mean of Cloudiness=0.50.

WIND.

Resultant Direction N. 67° W.; Resultant Velocity 1.19 miles.

Mean Velocity 3.56 miles per hour.

Maximum Velocity 35.0 miles, from 1.30 to 2.30 p.m. of 26th.

Most Windy day 26th; Mean Velocity 10.37 miles per hour.

Least Windy day 25th; Mean Velocity 0.69 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 7.75 miles per hour.

Least Windy hour 4 a.m.; Mean Velocity 0.97 miles per hour.

Thunder or lightning occurred on 1st, 2nd, 3rd, 9th, 10th, 11th, 12th, 16th, 21st, 24th, 28th, and 29th.

Dew recorded on only three occas

COMPARATIVE TABLE FOR JULY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity.
	°	°	°	°	°							
1844	66.0	— 1.3	86.6	40.1	46.5	12	2.815	..	..	..	..	0.19 lbs
1845	66.2	— 1.1	95.0	45.7	49.3	7	2.195	..	..	..	..	0.30
1846	68.0	+ 0.7	94.6	44.5	50.1	9	2.896	..	..	..	..	0.29
1847	68.0	+ 0.7	87.0	43.2	43.8	18	3.355	..	..	..	..	0.19
1848	65.5	— 1.8	82.2	44.1	38.1	10	1.899	..	..	N 14 W	0.18	4.94mls
1849	68.4	+ 1.1	88.6	45.2	43.4	4	3.415	..	..	S 5 W	0.75	3.52
1850	68.9	+ 1.6	86.2	51.6	34.6	12	5.270	..	..	N 81 E	0.59	4.56
1851	65.0	— 2.3	82.7	46.5	36.2	12	3.625	..	..	N 60 W	0.88	4.13
1852	66.8	— 0.5	90.1	48.5	41.6	8	4.025	..	..	N 43 W	0.93	3.33
1853	65.6	— 1.7	91.3	41.6	49.7	10	0.915	..	..	S 58 E	0.24	3.69
1854	72.5	+ 5.2	98.0	42.5	55.5	9	4.805	..	..	S 49 W	0.37	4.03
1855	67.9	+ 0.6	92.8	49.2	43.6	13	3.245	..	..	S 19 W	0.73	6.47
1856	69.9	+ 2.6	90.6	49.5	47.1	8	1.120	..	..	N 79 W	1.57	5.84
1857	67.8	+ 0.5	86.6	47.0	39.6	15	3.475	..	..	S 68 E	0.81	4.74
1858	67.9	+ 0.6	85.0	52.0	33.0	13	3.072	..	..	N 15 E	1.13	5.76
1859	66.9	— 0.4	88.0	44.7	43.3	12	2.611	..	..	N 56 W	1.48	5.81
1860	63.9	— 3.4	88.0	43.8	44.2	13	4.336	..	..	N 60 W	2.15	7.29
1861	65.4	— 1.9	84.5	47.0	37.5	16	2.635	..	..	N 74 W	1.43	4.66
1862	66.7	— 0.6	95.5	48.2	47.3	15	5.344	..	..	S 89 W	1.42	5.80
1863	67.6	+ 0.3	83.5	48.0	35.5	15	3.408	..	..	N 18 W	0.40	3.89
1864	69.7	+ 2.4	90.2	49.0	41.2	8	1.332	..	..	N 61 W	2.23	6.00
1865	65.0	— 2.3	83.0	45.8	37.2	11	2.470	..	..	N 86 W	2.28	5.34
1866	70.4	+ 3.1	94.0	47.8	46.2	16	5.390	..	..	S 79 W	0.94	4.17
1867	68.2	+ 0.9	94.0	48.2	45.8	12	1.965	..	..	N 48 W	1.40	5.45
1868	75.8	+ 8.5	93.4	59.0	34.4	5	0.510	..	..	S 87 E	0.72	4.66
1869	64.5	— 2.8	84.9	49.8	35.1	13	4.610	..	..	S 67 W	2.01	5.07
1870	68.8	+ 1.5	87.4	48.0	39.4	16	1.896	..	..	S 78 W	1.59	4.82
1871	66.0	— 1.3	88.4	47.8	40.6	11	1.255	..	..	N 88 W	1.55	5.67
1872	70.2	+ 2.9	96.0	52.2	43.8	13	2.297	..	..	N 67 W	1.19	3.56
Results to 1871.	67.29	...	89.22	47.08	42.14	10.66	3.248	...	...	N 77 W	0.78	4.99
Excess for '72.	+ 2.87	...	+ 6.78	+ 5.12	+ 1.66	+ 2.34	— 0.951	...	...	...	...	— 1.43

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—AUGUST, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 P.M	MEAN	Excess of Mean above Aver'ge.	Tension of Vapour. 6 A.M	2 P.M.	10 P.M.	M'N.	Humidity of Air. 6 A.M.	2 P.M.	10 P.M.	M'N.	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant.	Velocity of Wind. 6 A.M.	2 P.M	10 P.M	Res'l-tant.	MEA	Rain in inches.	Snow in inches.
1	29.571	29.554	29.532	29.5415	60.7	70.1	60.0	63.78	— 4.28	.363	.321	.444	.399	68	43	85	69	E	E	NE	N 78 E	1.6	13.8	4.4	4.72	4.90	0.180	...
2	.478	.457	.525	.4883	59.3	67.9	60.0	62.28	— 5.78	.441	.590	.4 0	.489	88	87	88	87	NE	E	N	N 86 E	2.4	3.0	0.4	0.76	2.12	0.150	...
3	.575	.604	.669	.6236	57.8	70.8	59.3	63.27	— 4.85	.377	.509	.428	.436	82	67	85	75	N	S	Calm.	N 25 W	6.1	3.8	0.0	0.77	2.38	...	...
4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S	Calm.	S 25 E	0.0	4.0	0.0	0.59	1.37	...	...
5	.827	.766	.718	.7645	56.0	76.6	67.2	68.93	+ 1.18	.400	.621	.477	.533	89	68	72	75	Calm.	S	W	S 27 W	0.0	3.4	0.2	1.56	1.73	...	...
6	.737	.691	.686	.7042	62.9	77.3	67.9	70.33	+ 2.67	.467	.553	.603	.551	81	59	88	75	Calm.	S E	Calm.	S 3 W	0.0	5.0	0.0	1.78	2.09	...	...
7	.691	.720	.699	.7043	65.8	77.0	69.4	71.35	+ 3.80	.576	.662	.616	.623	90	71	86	81	Calm.	S	Calm.	S 17 W	0.0	7.1	0.0	1.16	1.17	.270	...
8	.691	.720	.679	.6943	66.8	84.9	69.0	74.35	+ 6.92	.590	.704	.479	.580	89	59	68	69	Calm.	S	Calm.	S 7 W	0.0	6.5	0.0	2.32	2.37	...	...
9	.692	.611	.547	.6109	67.2	84.2	73.0	75.82	+ 8.50	.584	.731	.626	.652	88	62	77	74	Calm.	S	Calm.	S 23 W	0.0	6.0	0.0	3.45	3.68	.030	...
10	.536	.561	.606	.5677	69.7	81.2	68.6	74.63	+ 7.47	.669	.653	.458	.591	92	61	65	69	W	N W	N	N 42 W	3.0	3.4	0.8	2.60	3.09	Inap	...
11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	Calm.	E	N 6 E	0.0	0.0	2.0	0.28	0.37	.025	...
12	.651	.657	.629	.6392	66.9	70.1	66.7	68.58	+ 1.68	.598	.621	.598	.613	89	84	91	88	Calm.	N E	Calm.	N 52 E	0.0	5.0	0.0	1.24	1.37	.020	...
13	.611	.558	.502	.5456	60.5	73.7	69.4	70.49	+ 3.65	.622	.631	.616	.626	95	76	86	85	Calm.	Calm.	N	N 24 E	0.0	0.0	3.4	0.46	0.74	.100	...
14	.485	.471	.458	.472	68.3	74.1	67.9	70.87	+ 4.28	.644	.732	.622	.664	93	87	81	88	Calm.	Calm.	W	N 47 W	0.0	0.0	0.8	0.23	0.24	.270	...
15	.552	.678	.728	.6552	63.6	75.9	67.6	69.57	+ 3.13	.524	.521	.484	.519	89	58	82	73	W	N	N	N 27 W	1.0	1.5	7.5	3.53	4.05	...	...
16	.726	.681	.619	.6692	65.4	71.9	65.1	67.53	+ 1.28	.501	.521	.493	.509	80	66	79	75	E	E	Calm.	N 82 E	2.0	7.5	0.0	3.21	3.59	...	...
17	.651	.640	.627	.6340	60.4	79.5	71.2	71.37	+ 5.30	.475	.695	.649	.602	91	69	85	79	Calm.	S	Calm.	S 14 W	0.0	10.5	0.0	4.47	4.80	...	...
18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S W	N	S 51 W	0.0	2.8	2.2	0.99	1.27	.110	...
19	.777	.803	.805	.7963	66.5	75.2	79.7	71.37	+ 5.68	.553	.610	.699	.620	85	70	96	81	Calm.	Calm.	Calm.	N 10 E	0.0	0.0	0.0	0.75	0.97	Inap	...
20	.851	.844	.775	.8142	66.8	77.7	72.3	72.40	+ 6.90	.575	.653	.710	.675	87	69	90	85	Calm.	S E	Calm.	S 16 E	0.0	3.4	0.0	0.94	0.98	.010	...
21	.729	.649	.557	.6368	69.0	82.0	73.7	76.03	+10.75	.694	.829	.758	.763	98	76	91	85	Calm.	S W	Calm	S 51 W	0.0	9.5	0.0	3.16	3.19	Inap.	...
22	.504	.469	.557	.5182	77.0	89.9	69.7	78.63	+13.59	.762	.519	.389	.533	82	37	53	55	W	N W	N W	N 48 W	1.4	25.6	9.4	8.94	9.29	Inap	...
23	.638	.623	.620	.6263	65.0	79.1	65.0	70.57	+ 5.72	.532	.733	.468	.552	86	74	76	74	N	S W	Calm.	N 43 W	8.8	5.4	0.0	4.10	5.96	...	...
24	.651	.623	.559	.6100	55.7	79.1	79.2	70.42	+ 5.82	.338	.398	.545	.435	75	40	71	59	Calm.	S	S E	S 2 W	0.0	2.0	1.2	0.95	0.97	...	...
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S	N W	S 23 W	0.0	2.8	2.4	0.47	0.68	Inap.	...
26	.671	.644	.555	.6163	62.9	77.3	74.4	72.73	+ 8.63	.508	.643	.681	.619	89	69	81	77	Calm.	S	S W	S 34 W	0.0	0.4	0.6	1.01	1.70	Inap.	...
27	.573	.626	.665	.6288	63.2	76.6	67.2	69.78	+ 5.95	.517	.297	.360	.401	90	32	54	57	N W	N	N	N 21 W	4.4	10.7	2.6	9.28	9.44	.110	...
28	.674	.620	.581	.6173	62.9	73.6	64.0	67.53	+ 3.77	.417	.568	.465	.480	73	69	78	71	N S	S E	Calm.	N 85 W	0.2	5.0	0.0	2.02	3.19	...	...
29	.518	.373	.311	.3883	62.9	72.6	63.2	66.42	+ 3.12	.479	.527	.475	.503	83	66	82	78	Calm.	S E	N W	S 49 W	0.0	2.6	16.4	1.50	5.38	.130	...
30	.388	.452	.447	.4372	52.4	54.2	58.6	56.08	— 6.98	.303	.279	.309	.296	77	66	62	64	N W	N W	N W	N 50 W	19.6	25.2	11.0	16.94	17.19	Inap.	...
31	.516	.568	.640	.5800	55.0	66.9	58.6	61.17	— 1.63	.363	.293	.288	.287	70	44	57	54	N W	N W	N W	N 39 W	11.2	19.8	10.8	15.03	15.21	...	...
	29.6283	29.6171	29.6036	29.6142	63.54	75.51	67.03	69.48	+ 3.52	.511	.571	.526	.539	85	64	78	74	.....	.....	.....	.....	1.99	6.31	2.45	...	3.73	2.405	...

clix

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....29.853 at 8 a.m. on 20th. } Monthly range
Lowest Barometer.....29.311 at 10 p.m. on 20th. } 0.542.

Self-registering Ther.
- Maximum Temperature .....91°8 on 22nd. } Monthly range
- Minimum Temperature.....51°0 on 30th. } 40.8.
- Mean Maximum Temperature .....78°57. } Mean daily range
- Mean Minimum Temperature .....61°22. } 17°35.
- Greatest daily range.....26°4 from a.m. to p.m. of 24th.
- Least daily range.....9°0 from a.m to p.m. of 12th.

Warmest day.....22nd...Mean Temperature.....78°63 } Difference=22°55.
Coldest day.....30th...Mean Temperature.....56°08 }

Maximum } Solar .....152°0 on 21st. } Monthly range
Radiation } Terrestrial.....43°0 on 24th. } 109.0.

Aurora observed on 8 nights, viz.: 3rd, 4th, 8th, 9th, 14th, 24th, 25th, and 29th.

Possible to see Aurora on 26 nights; impossible on 5 nights.

Raining on 19 days; depth 2.405 inches; duration of fall 22.8 hours.

Mean of Cloudiness, 0.56.

WIND.

Resultant Direction N. 51° W.; Resultant Velocity 1.43 miles.

Mean Velocity 3.73 miles per hour.

Maximum Velocity 28.0 miles, from noon to 1 p.m. of 30th.

Most Windy day 30th; Mean Velocity 17.19 miles per hour.

Least Windy day 14th; Mean Velocity 0.24 miles per hour.

Most Windy hour noon; Mean Velocity 7.40 miles per hour.

Least Windy hour 8 p.m.; Mean Velocity 1.89 miles per hour.

Solar halo on 24th.

Fog 21st at 6 a.m.

Rainbows on 1st and 2nd.

Thunder on 10 days.

Lightning on 8 days.

August 9th, 10th and 12th considerable numbers of Shooting Stars observed.

COMPARATIVE TABLE FOR AUGUST.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°					°		
1844	64.3	— 1.8	86.8	43.5	43.3	17	Imp.	..	..	...	...	0.16lbs
1845	67.9	+ 1.8	84.8	41.5	43.3	9	1.725	..	..	...	...	0.19
1846	68.4	+ 2.3	86.4	49.5	36.9	9	1.770	..	..	...	...	0.17
1847	65.1	— 1.0	82.6	44.6	38.0	10	2.140	..	..	...	...	0.19
1848	69.2	+ 3.1	87.0	48.7	38.3	8	0.855	..	..	S 21 W	0.98	4.55mls
1849	66.3	+ 0.2	79.0	49.0	30.0	10	4.970	..	..	N 71 W	0.60	3.76
1850	66.8	+ 0.7	85.0	41.0	44.0	13	4.355	..	..	N 15 E	0.35	4.46
1851	63.6	— 2.5	79.8	42.0	37.5	10	1.360	..	..	N 63 W	0.40	4.63
1852	65.9	— 0.2	81.2	45.8	35.4	9	2.695	..	..	N 70 E	0.56	3.30
1853	68.6	+ 2.5	94.9	42.5	52.4	11	2.575	..	..	S 36 E	0.30	4.26
1854	68.0	+ 1.9	99.2	45.6	53.6	5	0.455	..	..	N 64 W	1.76	4.60
1855	64.1	— 2.0	83.5	40.0	43.5	7	1.455	..	..	N 63 W	1.04	6.97
1856	63.6	— 2.5	82.7	41.5	41.2	12	1.680	..	..	N 50 W	2.88	7.03
1857	65.3	— 0.8	88.2	46.0	42.2	13	5.265	..	..	N 77 W	1.51	6.36
1858	67.6	+ 1.5	84.0	44.0	40.0	11	3.890	..	..	N 69 W	1.57	6.50
1859	66.6	+ 0.5	82.2	45.8	36.4	11	3.900	..	..	N 36 W	1.62	5.96
1860	64.9	— 1.6	87.0	46.8	40.8	14	3.405	..	..	N 70 W	1.83	5.80
1861	65.5	— 0.6	85.2	47.0	38.2	15	2.955	..	..	N 8 E	0.46	4.21
1862	67.6	+ 1.5	89.5	42.8	46.7	15	3.483	..	..	N 78 W	1.67	5.96
1863	66.6	+ 0.5	88.0	42.4	45.6	12	2.208	..	..	S 61 W	1.80	4.89
1864	68.6	+ 2.5	94.0	47.0	47.0	16	5.060	..	..	N 70 W	1.38	4.75
1865	65.2	— 0.9	87.8	44.4	43.4	8	1.990	..	..	N 60 W	1.55	5.07
1866	60.8	— 5.3	77.0	42.4	34.6	14	4.457	..	..	N 59 W	2.58	5.16
1867	68.1	+ 2.0	95.2	42.2	53.0	10	2.440	..	..	N 76 W	1.25	4.52
1868	67.2	+ 1.1	84.4	46.8	37.6	13	1.562	..	..	S 58 W	1.01	6.15
1869	63.9	— 2.5	89.0	43.5	45.5	11	4.273	..	..	N 42 W	1.98	5.13
1870	67.1	+ 1.0	84.0	40.0	44.0	14	3.422	..	..	N 75 W	1.80	5.92
1871	67.4	+ 1.3	89.5	46.0	43.5	8	2.800	..	..	N 52 W	1.09	6.86
1872	69.5	+ 3.4	91.8	51.0	40.8	19	2.405	..	..	N 51 W	1.43	3.73
Res'lts to 1871.	66.08	...	86.25	44.37	41.98	10.81	3.021	..	..	N 66 W	1.10	5.28
Excess for '72.	+ 3.40	...	+ 5.45	+ 6.63	— 1.18	+ 8.19	— 0.616	..	..			— 1 55

MONTHLY METEROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—SEPTEMBER, 1872.

Latitude—43°39′4 *North*. *Longitude*—5*h*. 17*m*. 33*s*. *West*. *Elevation above Lake Ontario*, 108 *feet*.

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal	Tension of Vapour.				Relative Humidity				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in inches	Snow in inches.
	6 A. M.	2 P. M.	10 P. M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A. M.	2 P. M.	10 P. M.	M'N.	6 A. M.	2 P. M.	10 P. M.	M'N.	6 A. M.	2 P. M.	10 P. M.		6 A. M.	2 P. M.	10 P. M.	Res'l-tant.	MEAN		
					°	°	°	°	°																			
1	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	N W	N W	Calm.	N 57 W	10.0	19.0	0.0	10.64	10.77	...	...
2	29.602	29.640	29.731	29.6703	65.0	70.1	54.2	62.08	— 0.17	.439	.322	.208	.305	71	44	49	53	N W	N W	N	N 31 W	10.4	15.2	12.6	12.13	13.00	...	...
3	.821	.752	.719	.7622	44.8	60.0	50.3	52.05	— 9.93	.214	.281	.230	.220	72	53	63	59	N	S W	N	N 12 W	1.0	3.4	4.2	2.07	3.77	...	...
4	.750	.644	.592	.6515	45.9	60.7	55.0	55.07	— 6.62	.249	.349	.402	.330	80	66	93	76	Calm.	S	Calm.	S 1 E	0.0	5.1	0.0	1.72	1.98	.150	...
5	.450	.416	.412	.4273	54.6	66.5	62.9	61.60	+ 0.22	.407	.566	.547	.506	95	87	95	92	N E	E	E	S 72 E	2.5	1.0	1.5	1.34	1.62	.050	...
6	.416	.452	.457	.4463	62.5	73.7	65.1	66.73	+ 5.68	.566	.675	.585	.598	100	81	94	91	Calm.	S	Calm.	S 67 E	0.0	1.2	0.0	1.57	1.75	.190	...
7	.510	.477	.513	.4985	61.4	82.0	73.0	72.85	+12.13	.513	.727	.684	.651	94	67	84	81	Calm.	S W	Calm.	S 37 W	0.0	12.7	0.0	3.29	3.35	...	...
8	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	Calm.	W	N	N 87 W	0.0	14.5	8.8	2.90	3.90	.010	...
9	.713	.738	.751	.7352	64.0	63.6	61.8	63.48	+ 3.50	.507	.512	.469	.500	85	87	85	85	N E	E	E	N 77 E	4.4	8.6	8.2	6.14	6.39	.200	...
10	.750	.713	.751	.7322	61.4	72.6	63.2	65.27	+ 5.67	.512	.601	.451	.519	94	75	78	83	N E	Calm.	N	N 77 E	2.4	0.0	1.0	2.70	3.01	Inap.	...
11	.768	.699	.614	.6822	63.2	71.9	66.5	67.62	+ 8.42	.569	.654	.593	.609	98	84	91	90	Calm.	E	S E	S 82 E	0.0	6.0	1.4	1.92	2.02	...	...
12	.505	.301	.391	.4110	66.5	72.6	63.6	67.50	+ 8.68	.580	.631	.537	.596	89	78	92	88	E	S	N W	S 30 E	3.2	10.2	2.5	0.84	3.21	.460	...
13	.423	.637	.848	.6645	62.5	61.4	52.4	58.17	— 0.25	.526	.412	.327	.393	93	76	83	80	W	N W	N W	N 46 W	13.2	22.4	4.2	12.47	12.68	.050	...
14	.916	.918	.924	.9117	45.6	63.6	53.1	54.88	— 3.13	.260	.243	.317	.273	85	41	78	66	Calm.	N	N	N 2 E	0.0	5.5	8.6	5.14	5.25	...	...
15	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	N	S	Calm.	N 88 E	3.4	5.3	0.0	1.21	2.76	...	...
16	.718	.584	.548	.6045	45.6	61.8	56.8	56.10	— 1.12	.241	.384	.378	.346	79	70	81	76	N	S	N E	S 59 E	1.2	1.0	3.0	0.51	1.69	...	...
17	.554	.537	.562	.5495	53.5	64.7	50.3	56.22	— 0.57	.355	.418	.321	.366	86	68	88	81	N	S W	Calm.	N 68 W	2.0	5.6	0.0	0.39	1.71	...	...
18	.500	.360	.276	.3702	43.0	59.3	54.2	53.85	— 2.52	.256	.405	.389	.364	92	80	92	87	Calm.	S	S W	S 27 W	0.0	12.8	4.2	3.05	3.57	.500	...
19	.234	.287	.510	.3568	49.9	60.4	52.4	53.58	— 2.35	.336	.353	.358	.347	93	67	91	85	N W	N W	N W	N 61 W	0.2	16.0	11.4	7.60	8.09	.508	...
20	.657	.707	.721	.7020	49.8	61.1	52.1	54.42	— 1.13	.294	.276	.297	.291	82	51	76	70	N W	N W	Calm.	N 54 W	1.0	8.3	0.0	7.12	7.51	...	...
21	.646	.524	.486	.5450	48.4	64.3	57.5	57.12	+ 2.00	.294	.387	.418	.381	86	64	88	82	Calm.	E	N E	S 87 E	0.6	4.8	0.2	1.19	1.27	...	...
22	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	W	S W	Calm.	S 55 W	0.8	4.6	0.0	1.73	1.96	.050	...
23	.741	.686	.708	.7005	59.3	66.9	60.7	62.30	+ 8.03	.503	.518	.497	.505	99	79	93	90	N E	E	Calm.	N 79 E	3.5	5.7	0.0	2.68	2.98	.030	...
24	.733	.603	.561	.6550	60.4	72.3	66.1	67.33	+13.50	.488	.531	.504	.511	93	67	79	77	Calm.	E	S E	S 58 E	0.0	3.0	4.4	1.65	1.82	...	...
25	.428	.466	.587	.4985	67.6	65.0	53.1	61.62	+ 8.20	.484	.414	.349	.430	72	67	86	78	S	S W	W	S 25 W	12.5	8.4	2.2	7.30	9.13	.028	...
26	.578	.470	.343	.4613	42.7	63.6	59.3	56.15	+ 3.17	.234	.337	.394	.325	85	57	78	72	Calm.	S	N W	S 26 W	0.0	13.6	17.0	6.75	7.16	.080	...
27	.511	.575	.652	.5912	44.5	56.8	46.3	48.82	— 3.78	.237	.235	.251	.235	80	50	79	69	W	W	Calm.	N 82 W	5.6	13.8	0.0	5.25	5.69	Inap	...
28	.754	.718	.590	.6860	39.1	56.4	53.5	50.68	— 1.50	.206	.260	.288	.256	86	57	70	70	N W	S E	E	S 61 E	0.6	5.6	12.0	2.25	4.15	...	...
29	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	E	S W	S W	S 8 W	9.8	13.8	13.5	7.93	13.98	.220	...
30	.432	.512	.602	.5292	49.9	57.1	49.5	52.23	+ 0.85	.274	.286	.301	.282	76	62	84	72	S W	W	Calm.	S 77 W	2.2	10.3	0.0	8.85	9.18	...	...
	29.6044	29.5838	29.5940	29.5937	54.05	65.13	57.32	59.11	+ 1.86	.382	.431	.404	.406	87	67	83	78	.....	.....	.....	.....	3.00	8.58	4.03	.....	5.24	2.526	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR SEPTEMBER, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M, and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....29.942 at 8 a.m. on 14th. } Monthly range
Lowest Barometer .....29.214 at 7 a.m. on 29th. } 0.728.

Self-registering Ther.
- Maximum temperature.....84°4 on 7th. } Monthly range
- Minimun temperature..... 38.2 on 28th. } 46°2
- Mean maximum temperature.....68°68 } Mean daily range
- Mean Minimum temperature.....50°51 } 18°17
- Greatest daily range.....27°5 from a.m. to p m. of 1st.
- Least daily range..... 9°0 from a.m to p m. of 9th.

Warmest day..... 7th; mean temperature 72°85 } Difference=24°03
Coldest day.....27th; mean temperature 48°82 }

Maximum { Solar .....140°0 on 1st. } Monthly range=121°6
Radiation { Terrestrial..... 27°4 on 3rd. }

Aurora observed on 4 nights, viz: 2nd, 3rd, 9th, and 29th.

Possible to see aurora on 18 nights; impossible on 12 nights.

Raining on 16 days; depth, 2.526 inches; duration of fall, 43.4 hours.

Mean of cloudiness, 0.58.

WIND.

Resultant direction, N. 79° W.; Resultant velocity, 1.47 miles.

Mean velocity, 5.24 miles per hour.

Maximum velocity, 29.0 miles, from 9 to 10 a.m. of 13th.

Most windy day, 29th; mean velocity, 13.98 miles per hour.

Least windy day, 21st; mean velocity, 1.27 miles per hour.

Most windy hour, 1 p. m.; mean velocity, 9.16 miles per hour.

Least windy hour, 5 a. m.; mean velocity, 2.93 miles per hour.

Fog on 6th, 11th, and 18th.

Dew on 6th, 15th, 21st and 24th.

Frost on 3rd, 14th, 16th, 26th, 27th, and 28th.—Ice on 27th.

Thunder or Lightning on 5th, 6th, 7th, 8th, 12th, 18th, 19th, 22nd, 23rd, 26th, and 29th.

Hail of large size and to a considerable amount fell in the storm of the 19th.

Solar Rainbow on 12th. Lunar Rainbow on 19th at 8 p.m.

COMPARATIVE TABLE FOR SEPTEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°		°	°	°							
1844	58.6	+ 0.6	81.8	28.2	53.6	4	impr	...	...	...	...	0.26 lbs.
1845	56.0	— 2.0	79.6	34.0	45.6	16	6.245	...	...	...	...	0.34
1846	63.6	+ 5.6	84.3	37.3	47.0	11	4.595	...	...	...	...	0.33
1847	55.6	— 2.4	74.5	35.0	39.5	15	6.665	...	...	...	...	0.33
1848	54.2	— 3.8	80.4	28.1	52.3	11	3.115	...	...	N 71 W	2.38	5.81mls.
1849	58.2	+ 0.2	80.1	32.7	47.4	9	1.480	...	...	N 75 W	0.69	4.23
1850	56.5	— 1.5	76.0	29.5	46.5	11	1.735	...	...	S 65 W	1.02	4.78
1851	60.0	+ 2.0	86.3	32.0	54.3	9	2.665	...	...	N 14 E	1.03	5.45
1852	57.5	— 0.5	81.8	35.8	46.0	10	3.630	...	...	N 17 W	0.53	4.60
1853	58.8	+ 0.8	85.5	33.9	51.6	12	5.140	...	...	N	1.06	4.33
1854	61.0	+ 3.0	93.6	35.8	57.8	14	5.375	...	..	N 22 W	1.33	4.04
1855	59.5	+ 1.5	82.6	33.0	49.6	12	5.585	...	...	N 20 E	1.29	7.61
1856	57.1	— 0.9	78.4	35.0	43.4	13	4.105	...	...	S 79 W	1.98	6.53
1857	58.6	+ 0.6	82.0	34.1	47.9	11	2.640	...	...	N 68 W	1.61	6.55
1858	59.1	+ 1.1	81.4	35.6	45.8	8	0.735	...	...	S 74 W	1.53	5.69
1859	55.2	— 2.8	75.4	35.7	39.7	15	3.525	...	...	N 44 W	1.40	6.36
1860	55.3	— 2.7	75.8	28.7	47.1	14	1.959	...	...	N 71 W	2.63	5.79
1861	59.1	+ 1.1	78.8	37.1	41.7	17	3.607	...	...	N 71 W	1.39	4.81
1862	59.6	+ 1.6	79.4	39.0	40.4	9	2.344	...	...	N 59 W	1.07	5.11
1863	55.9	— 2.1	80.0	31.4	48.6	8	1.235	...	...	N 16 W	1.92	6.46
1864	56.4	— 1.6	73.0	37.8	35.2	11	2.508	...	...	N 38 W	1.89	7.06
1865	64.5	+ 6.5	90.5	42.0	48.5	12	2.450	...	...	S 56 E	0.47	4.12
1866	55.2	— 2.8	80.0	34.4	45.6	15	5.657	...	...	N 33 W	1.45	4.63
1867	57.9	— 0.1	87.0	31.8	55.2	9	1.226	...	...	N 37 W	1.48	5.43
1868	56.6	— 1.4	75.5	36.0	39.5	16	4.239	...	...	N 74 W	0.88	6.68
1869	60.7	+ 2.7	81.0	34.4	46.6	8	4.027	...	...	N 53 W	1.16	4.89
1870	61.8	+ 3.8	78.0	45.8	32.2	11	6.794	...	...	N 29 E	2.26	5.04
1871	54.8	— 3.2	81.8	34.0	47.8	8	1.290	...	...	N 74 W	1.72	5.50
1872	59.1	+ 1.1	84.4	38.2	46.2	16	2.526	...	...	N 79 W	1.47	5.24
Res'lts to 1871	58.04	.....	80.88	34.58	46.30	11.06	3.716	...	...	N 52 W	1.06	5.44
Excess for '72.	+ 1.07	.....	+ 3.52	+ 3.62	— 0.10	+ 4.94	— 1.190	...	...	...	...	— 0.20

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—OCTOBER, 1872.

Latitude—43° 39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6A.M.	2P.M.	10P.M	MEAN		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 AM.	2 P.M.	10 P.M	Res'l-tant.	MEAN		
					°	°	°	°	°												°							
1	29.620	29.607	29.650	29.6253	45.9	52.8	42.7	47.13	— 3.85	.259	.267	.234	.248	84	66	85	77	Calm.	N	Calm.	N 40 W	0.0	17.2	0.0	4.76	4.94	Inap.	...
2	.643	.528	.494	.5487	40.2	58.2	48.1	48.83	— 1.75	.229	.226	.230	.227	92	46	68	68	Calm.	N W	Calm.	N 68 W	0.0	9.4	0.0	3.52	3.09	...	...
3	.401	.321	.493	.4083	44.5	60.7	48.4	51.08	+ 0.85	.255	.349	.246	.279	87	65	71	74	Calm.	N W	N	N 57 W	0.0	22.2	1.2	4.49	5.16	Inap.	...
4	.631	.675	.688	.6628	41.6	55.7	47.0	49.35	— 0.50	.240	.250	.242	.255	91	56	75	74	Calm.	S E	Calm.	S 67 E	0.0	3.4	0.0	0.40	1.23	...	...
5	587	.536	.557	.5560	50.3	61.8	55.3	56.63	+ 7.12	.331	.407	.397	.383	91	74	91	84	E.	E	Calm.	S 89 E	4.4	3.0	0.0	3.79	3.85	...	...
6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N.	Calm.	N	N 6 W	4.6	0.0	1.4	2.66	2.97	.880	...
7	.595	.602	.684	.6300	51.3	57.8	48.1	51.55	+ 2.77	.352	.331	.259	.310	93	69	78	81	N W	N	N W	N 25 W	2.8	4.9	8.0	5.17	5.27	.100	...
8	.760	.746	.732	.7487	40.2	55.0	43.8	46.43	— 2.02	.220	.269	.200	.234	88	62	70	75	N W	S	Calm.	N 75 W	1.0	5.0	0.0	0.73	1.75	...	...
9	.694	.525	.466	.5452	43.0	63.6	55.7	54.95	+ 6.82	.248	.408	.359	.345	89	69	80	79	Calm.	S W	S W	S 35 W	0.0	13.9	6.8	4.13	4.46	...	...
10	.485	.554	.668	.5850	48.8	48.8	38.4	43.72	— 4.10	.320	.172	.173	.213	93	50	73	74	N W	W	N W	N 57 W	10.5	19.1	8.8	10.06	10.45	.010	...
11	.779	.822	.806	.8078	48.0	42.7	36.9	38.88	— 8.63	.186	.168	.184	.173	81	61	84	73	N W	W	Calm.	N 46 W	3.0	7.4	0.0	3.96	4.27	...	...
12	.708	.546	.459	.5528	32.2	49.2	44.1	42.80	— 4.38	.162	.225	.224	.210	89	64	77	76	Calm.	S	Calm.	S 26 W	0.0	5.4	0.0	2.54	2.66	.060	...
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm,	S	N W	N 39 W	0.0	0.8	6.2	1.19	1.53	.240	...
14	.238	.290	.456	.3376	39.8	44.5	36.2	39.87	— 6.73	.188	.173	.159	.170	77	58	74	69	N.	N W	W	N 33 W	12.6	16.8	1.0	14.81	15.18	...	...
15	.473	.354	.252	.3423	31.9	38.7	42.0	39.03	— 7.32	.164	.202	.251	.205	91	86	94	86	Calm.	S	Calm.	S 34 W	0.0	4.4	0.0	2.21	2.62	.010	nap.
16	.298	.716	.897	.6763	43.0	47.0	32.6	41.12	— 4.95	.256	.158	.164	.183	92	49	89	72	N W	N W	Calm.	N 35 W	16.0	18.6	0.0	9.26	9.67	...	...
17	.869	.637	.612	.6945	33.3	41.8	43.4	41.08	— 4.79	.163	.253	.260	.228	86	96	93	88	E	N E	W	N 87 E	5.0	0.4	3.4	1.21	2.52	.308	...
18	.674	.695	.737	.7057	36.9	52.8	41.2	43.20	— 2.33	.208	.216	.224	.227	95	54	87	83	Calm.	N W	Calm.	N 55 W	0.0	6.6	0.0	1.75	1.84	.020	...
19	.723	.777	.834	.7885	34.4	43.4	33.0	37.72	— 7.55	.74	.125	.160	.162	88	43	85	73	Calm.	N W	Calm.	N 26 W	0.0	13.4	0.0	5.94	6.15	...	...
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	S	Calm.	S 5 E	0.0	0.4	0.0	0.03	0.15	...	...
21	.615	.593	.625	.6160	46.7	61.1	51.7	52.02	+ 7.22	.268	.355	.312	.306	83	66	81	79	S W	S W	Calm.	S 40 W	2.0	8.0	0.0	2.45	2.47	...	...
22	.633	.637	.862	.7265	47.0	62.5	48.1	50.67	+ 6.10	.283	.363	.278	.293	88	64	83	80	Calm	S W	N W	N 45 W	0.0	5.9	4.2	3.06	4.42	.010	...
23	.970	30.062	30.141	30.0725	42.3	50.3	39.4	44.00	— 0.3	.230	.170	.168	.188	85	47	69	66	N.	N.	N	N 10 W	7.8	5.0	5.0	5.69	5.89	...	...
24	30.154	30.120	30.030	30.0940	35.5	49.5	36.9	41.67	— 2.38	.176	.221	.184	.196	85	62	84	75	N E	E	Calm.	N 56 E	3.0	8.0	0.0	2.25	3.20	...	...
25	29.940	29.816	29.694	29.8012	43.6	52.1	48.8	49.25	+ 5.45	.291	.320	.330	.318	95	82	95	90	N E	E	N E	N 71 E	0.6	8.8	7.8	5.57	5.67	.160	...
26	.471	.361	.341	.3828	50.6	51.0	48.5	49.97	+ 6.38	.361	.372	.324	.352	98	99	95	98	N E	N E	N	N 36 E	9.4	4.2	4.4	6.63	6.8	1.290	...
27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	N	N	N 7 E	4.6	11.8	7.4	6.26	6.29	.200	...
28	.875	30.000	30.104	30.0115	36.9	47.7	37.6	40.45	— 2.65	.192	.186	.183	.186	87	56	81	75	N E	S E	N E	N 50 E	6.4	7.3	4.6	3.70	4.48	...	...
29	30.166	30.173	30.149	30.1638	35.1	47.0	44.8	42.55	— 0.32	.182	.223	.224	.198	89	68	75	72	N E	E	E	N 72 E	5.0	7.6	6.5	4.59	5.34	...	...
30	30.068	29.976	29.860	29.9542	39.4	49.9	46.3	45.32	+ 2.68	.202	.204	.204	.213	83	56	64	70	N E	E	S E	S 81 E	0.4	7.0	9.0	5.75	5.84	...	...
31	29.779	.686	.651	.7012	40.9	47.4	36.2	40.47	— 1.95	.211	.190	.167	.179	82	58	78	72	S E	E	Calm	S 47 E	1.1	5.0	0.0	1.38	1.50	...	...
	29.6981	29.6798	29.7016	29.6940	41.31	51.59	43.53	45.55	— 0.74	.235	.252	.235	.240	88	64	81	77	.....	.....	.....	.....	3.23	8.42	2.76	...	4.59	3.288	nap.

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR OCTOBER, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.194 at 8 a.m. on 29th } Monthly range=
Lowest Barometer.....29.226 at Midn't on 15th } 0.068.

Self-registering Ther.
- Maximum temperature.....70°0 on 6th. } Monthly range= 44°8
- Minimum temperature.....25°2 on 20th. }
- Mean maximum temperature.....54°11 } Mean daily range= 16°98.
- Mean minimum temperature.....37°13 }
- Greatest daily range.....25°6 from a.m. to p.m. of 3rd.
- Least daily range..... 5°0 from a.m. to p.m. of 26th.

Warmest day.....6th; mean temperature.....56°63 } Difference=18°91
Coldest day.....19th; mean temperature.....37°72 }

Maximum Radiation { Solar.....125°0 on 3rd } Difference=108.0.
{ Terrestrial.....17°0 on 20th }

Aurora observed on 9 nights, viz:—1st, 2nd, 3rd, 5th, 7th, 14th, 16th, 28th and 29th.

Possible to see Aurora on 21 nights; impossible on 10 nights.

Raining on 14 days; depth, 3.288 inches; duration of fall, 73.8 hours.

Mean of cloudiness=0.51.

Snowing on 1 day; depth inappreciable; duration of fall 0.5 hour.

WIND.

Resultant direction, N. 18° W.; resultant velocity, 2.22 miles.

Mean velocity, 4.59 miles per hour.

Maximum velocity, 29.2 miles, from 7.30 to 8.30 a.m. of 16th.

Most windy day, 14th; mean velocity, 15.19 miles per hour.

Least windy day, 20th; mean velocity, 0.15 miles per hour.

Most windy hour, 2 p.m.; mean velocity, 8.42 miles per hour.

Least windy hour, 11 p.m.; mean velocity, 2.54 miles per hour.

First Snow of the season on 14th.

Fog on the 5th, 9th 18th and 20th.

Thunder on 6th and 15th.

Lightning on 6th.

Lunar halo, on 11th

The Auroral display on the 14th was very brilliant, and accompanied by considerable magnetic disturbance.

COMPARATIVE TABLE FOR OCTOBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of Days.	RAIN. Inches.	SNOW. No. of days.	SNOW. Inches.	WIND. Resultant. Direction.	WIND. Resultant. V'locity.	WIND. Mean Velocity.
	°	°	°	°	°							
1844	43.3	— 2.6	71.6	15.9	55.7	7	Imp.	4	12.0	...	...	0.43 lbs.
1845	46.4	+ 0.5	64.0	19.7	44.3	11	1.760	1	Inap.	...	...	0.26
1846	44.6	— 1.3	70.1	20.7	49.4	14	4.180	2	Inap.	...	...	0.44
1847	44.0	— 1.9	64.6	20.4	44.2	13	4.390	2	Insp.	...	...	0.19
1848	46.3	+ 0.4	61.8	24.5	37.3	11	1.550	0	0.0	N 54 W	1.24	4.60 mls.
1849	45.3	— 0.6	58.9	24.2	34.7	13	5.965	1	Inap.	N 12 W	1.27	7.76
1850	45.4	— 0.5	66.7	22.4	44.3	10	2.085	0	0.0	N 66 W	1.10	5.30
1851	47.4	+ 1.5	66.2	25.2	41.0	10	1.680	2	0.3	S 72 W	1.06	4.39
1852	48.0	+ 2.1	70.7	23.8	46.9	12	5.280	0	0.0	N 5 E	1.19	4.47
1853	44.4	— 1.5	64.7	23.4	41.3	10	0.875	2	Inap.	S 88 W	1.74	4.77
1854	49.5	+ 3.6	75.4	26.4	49.0	15	1.495	3	Inap.	N 45 W	1.52	4.57
1855	45.4	— 0.5	68.0	22.6	45.4	14	2.485	5	0.8	N 82 W	4.91	9.88
1856	45.3	— 0.6	71.4	23.0	48.4	10	0.875	2	0.1	N 76 W	2.15	6.07
1857	45.4	— 0.5	64.0	26.5	37.5	10	1.040	2	0.2	N 19 W	2.93	6.24
1858	48.8	+ 2.9	76.3	31.5	44.8	17	1.797	1	Inap.	N 34 W	0.36	5.96
1859	43.0	— 2.9	69.8	22.3	47.5	11	0.940	4	Inap.	N 68 W	5.04	8.12
1860	47.3	+ 1.4	68.0	28.4	39.6	15	1.618	1	Inap.	N 9 W	2.00	6.93
1861	48.7	+ 2.8	71.0	29.0	42.0	15	1.993	1	Inap.	N 61 W	1.06	5.96
1862	48.7	+ 2.8	76.6	26.2	50.4	19	2.684	2	0.5	N 78 W	2.89	6.53
1863	45.9	0.0	66.4	30.5	35.9	16	2.522	0	0.0	S 71 W	0.48	6.16
1864	45.2	— 0.7	67.0	28.0	39.0	22	3.321	1	Inap.	N 60 W	3.17	6.66
1865	44.5	— 1.4	71.4	21.6	49.8	17	2.705	3	4.5	N 36 W	3.35	7.26
1866	49.1	+ 3.2	71.0	31.8	39.2	11	2.470	1	Inap.	N 30 W	0.84	5.58
1867	49.9	+ 4.0	75.4	31.0	44.4	11	1.970	0	0.0	N 45 W	1.51	5.73
1868	42.4	— 3.5	67.6	24.0	43.6	10	1.365	2	2.0	N 89 W	1.27	7.10
1869	42.3	— 3.6	69.8	18.7	51.1	8	0.962	7	2.3	N 89 W	3.72	6.73
1870	50.0	+ 4.1	68.5	30.2	38.3	16	2.690	0	0.0	N 85 W	1.86	7.11
1871	48.3	+ 2.4	72.2	28.6	43.6	13	1.185	0	0.0	S 66 W	3.75	7.84
1872	45.6	— 0.3	70.0	25.2	44.8	14	3.288	1	Inap.	N 18 W	2.22	4.59
Res'lts to 1871.	45.86	...	68.90	25.02	43.88	12.50	2.389	1.81	0 87	N 64 W	1.82	6.20
Excess for 1872	— 0.31	...	+ 1.10	+ 0.18	+ 0.92	+ 1.50	+ 0.899	— 0.81	— 0.87	...	...	— 1.61

MONTHLY METEROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—NOVEMBER, 1872.

Latitude—43°39′4 *North. Longitude*—5*h.* 17*m.* 33*s. West. Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	Mean.	Temp. of the Air. 6 A.M.	2 P.M.	10 PM	ME'N.	Excess of Mean above Normal	Tension of Vapour. 6 A.M.	2 P.M.	10 P.M.	M'N.	Relative Humidity. 6 A.M.	2 P.M.	10 P.M.	M'N.	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Res'l-tant.	MEAN	Rain in inches.	Snow in inches.
					°	°	°	°	°												°							
1	29.618	29.629	29.683	29.6468	34.0	47.7	36.9	39.78	— 2.35	.171	.214	.192	.197	87	63	87	80	N	N W	Calm.	N 68 W	0.2	14.0	0.0	2.79	2.88	...	...
2	.662	.567	.505	.5755	31.5	47.0	49.1	39.27	— 2.65	.162	.223	.215	.201	91	68	90	84	Calm.	Calm.	N	N 16 E	0.0	0.0	6.0	0.94	1.09	...	...
3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	N W	Calm.	N 2 E	6.4	2.2	0.0	2.77	3.20	...	...
4	.841	.894	.930	.8935	36.6	47.7	38.0	40.40	— 1.02	.196	.233	.204	.205	90	70	88	81	N W	S E	N E	N 87 E	4.4	3.4	2.2	0.15	1.65	...	...
5	.880	.775	.679	.7650	42.7	45.6	45.9	45.03	+ 3.88	.205	.222	.287	.249	74	73	93	83	S E	E	S	S 57 E	8.4	12.0	6.4	6.88	7.52	.160	...
6	.627	.635	.563	.6043	48.8	45.2	39.8	44.37	+ 3.47	.320	.200	.179	.226	93	66	73	76	S W	S W	S W	S 52 W	13.0	12.6	5.8	8.03	8.67	.010	...
7	.412	.069	.059	.1632	32.9	40.9	38.2	37.73	— 2.85	.168	.211	.183	.188	90	82	79	82	Calm.	S W	W	S 65 W	0.0	13.4	15.8	7.95	8.58	.060	...
8	.193	.348	.506	.3685	40.2	44.5	37.3	40.72	+ 0.40	.183	.191	.179	.183	73	65	80	72	W	W	W	N 76 W	20.8	18.4	2.0	15.52	15.89	...	...
9	.593	.641	.711	.6573	33.3	43.4	39.1	38.70	— 1.30	.150	.179	.189	.176	78	63	78	75	Calm.	N W	N W	N 72 W	0.0	9.6	0.4	3.83	4.03	...	...
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	E	E	N 82 E	5.0	7.8	14.0	4.99	6.34	...	...
11	.604	.532	.507	.5515	44.1	50.3	49.2	47.55	+ 8.25	.251	.279	.345	.289	87	77	98	88	Calm.	E	S W	S 4 W	0.0	1.0	2.0	0.37	1.48	.070	...
12	.543	.544	.681	.6083	42.7	43.4	32.9	39.32	+ 0.35	.251	.197	.160	.199	92	70	86	82	N W	N W	Calm.	N 60 W	4.0	8.6	0.0	4.34	4.45	.015	...
13	.720	.614	.457	.5832	31.5	45.0	42.7	39.13	+ 0.53	.162	.164	.197	.179	91	59	71	75	N	E	E	N 76 E	0.6	19.0	6.5	6.61	8.11	Inap.	...
14	.317	.320	.319	.3225	41.6	37.3	27.5	34.58	— 3.65	.239	.104	.087	.140	90	47	57	65	W	S W	W	S 62 W	5.0	11.8	11.0	7.50	8.93	.105	...
15	.275	.439	.480	.3998	23.6	35.1	29.3	29.13	— 8.70	.071	.121	.136	.114	56	59	84	69	W	W	W	S 79 W	7.2	19.4	3.4	12.96	13.04	...	Inap.
16	.557	.586	.721	.6338	21.0	30.8	22.8	24.75	—12.70	.095	.106	.100	.103	84	62	82	77	W	S W	W	S 71 W	2.8	8.6	4.8	5.11	5.57	...	...
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S W	W	S 72 W	6.6	14.1	7.6	7.84	8.32	..	...
18	.827	.742	.665	.7380	29.3	29.7	23.9	27.45	— 9.15	.144	.083	.095	.113	89	51	74	76	S W	W	W	S 87 W	5.7	17.0	16.2	11·03	11.42	...	Inap.
19	.580	.502	.486	.5197	22.5	27.9	24.6	25.05	—11.12	.104	.097	.107	.097	86	62	81	73	W	S W	W	S 81 W	9.0	8.0	5.8	8.79	8.88	...	0.1
20	.523	.634	.732	.6438	21.4	25.7	21.8	22.42	—13.30	.097	.068	.072	.078	84	48	62	66	W	N W	W	N 74 W	4.0	19.6	12.0	9.23	9.92	...	...
21	.704	.600	.536	.6040	22.1	32.6	32.6	29.10	— 6.18	.102	.135	.142	.123	86	72	77	76	W	S W	W	S 53 W	9.6	14.8	1.8	8.50	9.08	...	...
22	.528	.436	.508	.4973	30.4	33.3	31.3	32.18	— 2.63	.138	.181	.157	.161	81	95	89	88	Calm.	Calm.	W	S 88 W	0.0	0.0	2.8	1.88	2.42	..	0.1
23	.593	.575	.701	.6337	31.5	38.0	34.4	34.15	— 0.22	.155	.160	.150	.150	87	69	76	76	S W	S W	Calm.	S 66 W	11.2	10.5	0.0	5.74	5.78	...	0.1
24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Calm.	E	E	S 72 E	0.0	0.8	2.6	0.55	0.67	...	...
25	.216	.508	.698	.4933	44.9	41.6	28.3	38.25	— 4.85	.214	.131	.120	.153	72	49	77	65	S W	W	W	S 80 W	11.2	25.6	0.0	12.93	13.63	...	...
26	.702	.624	.686	.6752	28.6	36.6	27.2	30.18	— 2.75	.131	.126	.112	.118	83	57	75	71	N	S W	N W	N 82 W	2.8	5.0	3.4	1.76	2.46	...	...
27	.627	.637	.808	.7010	25.0	27.9	19.2	24.70	— 7.75	.116	.083	.064	.097	87	54	62	71	S W	W	W	S 73 W	8.2	30.4	13.6	14.67	16.08	...	0.1
28	.853	.663	.591	.7943	17.4	23.2	18.9	19.05	—12.92	.082	.083	.087	.083	86	66	84	81	W	S	N W	N 83 W	7.5	0.4	9.8	4.28	5.25	...	0.2
29	.587	.507	.341	.4730	9.5	21.4	16.4	14.92	—16.58	.059	.065	.052	.059	89	56	56	69	W	W	N W	N 75 W	2.3	12.2	18.2	9.12	9.45	...	...
30	.287	.321	.395	.3452	13.8	20.0	19.2	17 78	—13.25	.068	.093	.089	.082	85	86	86	84	N W	W	W	N 73 W	13.5	27.7	16.2	18.57	19.55	...	0.7
	29.5719	29.5515	29.5749	29.5689	30.80	36.92	31.40	32.91	— 4.33	.155	.152	.150	.152	84	65	79	76	.....	.....	.....	.....	5.63	11.60	6.34	...	7.48	0.420	1.3

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR NOVEMBER, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M, and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....29.966 at 7 a.m. on 17th. } Monthly range
Lowest Barometer .....29.047 at 4 p.m. on 7th. } 0.919.

Self-registering Ther.
- Maximum temperature.....52°0 on 11th. } Monthly range
- Minimum temperature..... 8.2 on 29th. } 43°8
- Mean maximum temperature.....40°56 } Mean daily range
- Mean Minimum temperature.....26°11 } 14°45
- Greatest daily range.....23°6 from a.m. to p.m. of 25th.
- Least daily range..... 7°8 from a.m. to p.m. of 19th.

Warmest day.....11th; mean temperature 47°55 } Difference=32°63
Coldest day.....29th; mean temperature 14°92 }

Maximum { Solar .....105°8 on 10th. } Monthly range=107°8
Radiation { Terrestrial..... −2°0 on 29th. }

Aurora observed on 6 nights, viz: 1st, 6th, 23rd, 25th, 26th and 27th.

Possible to see aurora on 19 nights; impossible on 11 nights.

Raining on 7 days; depth, 0.420 inches; duration of fall, 21.4 hours.

Snowing on 9 days; depth, 1.3 inches; duration of fall, 25.6 hours.

Mean of cloudiness, 0.68.

WIND.

Resultant direction, S. 85° W.; Resultant velocity, 5.15 miles.

Mean velocity, 7.48 miles per hour.

Maximum velocity, 37.0 miles, from noon to 1 p.m. of 25th.

Most windy day, 30th; mean velocity, 19.55 miles per hour.

Least windy day, 24th; mean velocity, 0.67 miles per hour.

Most windy hour, 1 p.m.; mean velocity 12.47 miles per hour.

Least windy hour, 2 a.m.; mean velocity, 5.18 miles per hour.

Large number of shooting stars on the night of the 27th.

Solar haloes on 13th, 16th and 28th. Lunar haloes on 10th and 15th.

It will be seen from the comparative table, that the rain fall for this month was the smallest yet recorded at Toronto Observatory; a deficiency not compensated by the amount of snow, which was also much below the average.

COMPARATIVE TABLE FOR NOVEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1844	34.9	— 1.6	56.0	12.1	43.9	8	impr.	4	8.0	...	...	0.48 lbs.
1845	36.8	+ 0.3	59.5	8.1	51.4	7	1.105	4	5.0	...	...	0.53
1846	41.3	+ 4.8	55.6	18.0	37.6	12	5.805	2	0.4	...	...	0.64
1847	38.6	+ 2.1	57.9	8.7	49.2	14	3.155	3	inap.	...	...	0.56
1848	34.5	— 2.0	49.0	15.9	33.1	9	2.020	3	1.4	N 81 w	1.81	4.81mls.
1849	42.6	+ 6.1	56.4	26.5	29.9	10	2.815	2	1.0	N 39 w	1.55	4.78
1850	38.8	+ 2.3	62.8	11.0	51.8	7	2.955	1	inap.	N 42 w	1.43	5.27
1851	32.9	— 3.6	50.2	13.8	36.4	5	3.855	6	6.7	N 50 w	1.25	4.70
1852	36.0	— 0.5	50.4	18.2	32.2	7	1.775	3	2.0	N 59 w	1.53	6.50
1853	38.7	+ 2.2	55.6	12.8	42.8	15	2.425	6	2.7	N 9 w	0.55	5.52
1854	36.8	+ 0.3	55.4	13.8	41.6	13	1.115	4	1.3	W	3.44	7.54
1855	38.6	+ 2.3	59.2	15.5	43.7	8	4.590	6	3.0	N 66 w	3.18	10.81
1856	37.4	+ 0.9	56.4	18.8	37.6	10	1.375	9	9.5	S 85 w	2.95	8.75
1857	33.5	— 3.0	58.2	-3.5	61.7	14	3.235	9	6.9	S 61 w	5.45	9.25
1858	34.2	— 2.3	53.0	15.3	37.7	12	3.879	13	4.0	N 25 w	3.14	8.87
1859	38.9	+ 2.4	62.6	21.8	40.8	12	5.193	9	0.6	N 81 w	3.39	9.65
1860	37.9	+ 1.4	64.5	13.2	51.3	12	2.569	8	1.9	S 89 w	4.95	11.02
1861	37.1	+ 0.6	52.4	23.0	29.4	14	4.294	8	3.2	N 46 w	1.94	7.44
1862	35.6	— 0.9	58.0	16.2	41.8	11	2.205	11	5.3	N 46 w	3.00	6.60
1863	39.1	+ 2.6	67.0	17.8	49.2	13	3.656	6	0.1	N 88 w	3.50	7.86
1864	36.9	+ 0.4	60.2	21.0	39.2	11	3.765	8	4.5	S 72 w	3.82	7.64
1865	38.6	+ 2.1	63.2	23.6	39.6	5	0.975	7	1.1	N 79 w	2.98	7.90
1866	38.4	+ 1.9	54.2	21.8	32.4	13	2.963	4	2.2	S 88 w	3.00	6.96
1867	36.9	+ 0.4	60.4	9.6	50.8	8	1.835	9	0.9	S 87 w	4.02	7.76
1868	36.2	— 0.3	50.5	20.1	30.4	14	5.150	10	4.3	S 35 w	2.10	8.16
1869	32.7	— 3.8	58.0	13.0	45.0	9	2.540	18	10.2	N 78 w	3.69	8.12
1870	36.6	+ 0.1	57.2	19.4	37.8	6	0.594	5	3.1	N 89 w	4.31	8.74
1871	30.6	— 5.9	47.1	0.0	47.1	10	2.655	12	4.5	N 45 w	4.08	10.35
1872	32.9	— 3.6	52.0	8.2	43.8	7	0.420	9	1.3	S 85 w	5.15	7.48
Res'lts to 1871	36.53	.....	57.82	15.20	41.62	10.03	2.977	6.88	3.28	N 76 w	2.68	7.71
Excess for '72.	— 3.62	.....	— 5.82	— 7.00	+ 2.18	— 3.03	— 2.557	+ 2.12	— 1.98	...	...	— 0.23

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THE CANADIAN JOURNAL.

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MERTON COLLEGE AND CANADA.

BY HENRY SCADDING, D.D.

Read before the Canadian Institute, January 11, 1873, as the President's Address for the Session 1872-3.

During my stay for some weeks at Oxford, a few years since, I was led to take a peculiar interest in Merton College, in that University; and had circumstances rendered it in any way advisable for me to become an incorporated member of the University, I should certainly have asked to have my name entered on the boards of Merton. As it was, the minor privilege of *admissio comitatis causâ* sufficed for every purpose I had in view, and *that* did not require the selection of a college as a quasi-home or house, but gave, during the remainder of life, whenever resident in Oxford, without any such limitation, all the advantages of degree and rank, the franchise alone excepted, which my position in the sister University of Cambridge could claim for me there. And I cannot refrain from confessing that even the semblance of affiliation with ancient and venerable Oxford which a mere *admissio comitatis causâ* creates—formally conferred by the Vice-Chancellor in the Convocation-house, and duly enregistered, and printed in the Calendar of the day—was vastly enjoyed by me as a small incident of romance occurring unexpectedly in one's experience. But more than this, the positive benefits accruing from the privilege were found to be of very great value. Besides giving the right and the pleasure on any occasion of assuming in the

University the academic dress, it secured a fixed place in public assemblages, and opened the way with extra facility to libraries and museums, as well as to the lecture-rooms, in several instances, of professors of preëminent ability and world-wide fame. And, as I have said, the boon is good for the remainder of one's days.

I need not say, I endeavoured to avail myself to the utmost of the rich and varied privileges with which, for a period all too brief, I found myself surrounded.

In respect of area covered by buildings and in regard to external grandeur, Merton College cannot compare with Christ Church, All Souls, New College, Balliol, and perhaps other Colleges in the University of Oxford. But no College in the University matches Merton in severe venerableness of aspect, or in the extent, I think, to which, in its general outline, it has retained unaltered the visible embodiment of the ideas of its several very early architects.

Its entrance gateway, bearing the statues of Henry III. and Walter de Merton, founder of the College; the two diminutive courts or quadrangles first traversed inside; the low vaulted passage leading from one to the other of them; the east window of the chapel and the massive square tower seen just beyond the gable; the steep slopes of the Treasury-roof, made fireproof by plates of rough ashlar instead of slate; finally, the quaint lights of the Library along the walls, and rising above the eaves of the roof on the south and west sides of the third court; all at first sight stir the imagination very strongly and stamp themselves indelibly on the memory.

Of the Library just named—its internal air and aspect—I desire especially to speak to you for a moment, such a surprise and delight was it to myself when I first entered it, either from not having been previously aware of its existence, or else from never having fallen in with any striking description of it.

It is supposed to be at the present day the most genuine ancient library in the British Islands. Its shelves and books look as if they had not been meddled with for several centuries. The wood of the book-cases has a pale weather-worn hue. The covers of the volumes are almost all of them of vellum or forel, with the names of the authors or matters treated of in them inscribed with a pen on the back, or on the outer edge of the leaves when the book is turned on the shelf with its back inward and clasps outward. Some of the volumes are still attached by chains to the bookcases, with the con-

trivance of a small pole or rod for the shifting of the volumes some distance to the right or left along a slope for its reception when open, while in front of the slope a rude bench is fixed for the accommodation of readers.

The ponderous balustrades of the staircase leading up to the Library, the amount of timber, or lumber as we should say, in the heavy tables and stools placed here and there, the floor, the roof, the plank employed in the carpentry of the cases and closets, all indicate a period when wood was plentiful in the land.

I expected to read in Antony à Wood an enthusiastic account of Merton Library, but I was disappointed to find that he spoke of it with no especial warmth. It may be that in his day, the libraries of the other Colleges of the University all wore an aspect so like that of Merton that, in his view, it possessed no peculiarity. He chiefly bemoans certain plunderings that had taken place therein at the period of the Reformation, and previously.

However, after all, the internal arrangements of Merton Library are late as compared with the date of the foundation of the College. Notwithstanding the very quaint and antique look of everything about it, most of the fittings, we are told, are of the time of James the First. One would scarcely have imagined this, at first sight: although, as we remember, two high, thinnish, wooden arches, somewhat of a triumphal character, near the head of the staircase, forming an entrance, one of them to the north wing, the other to the east wing of the Library, exhibited a style which was post-mediæval.

But this nevertheless is certain, that the two spacious rooms which now shelter the collection of books at Merton are the apartments designed and built in 1376, by Bishop Rede, of Chichester, one hundred and twelve years after the foundation of the College; and that many of the volumes still to be seen here, in manuscript, of course, are portions of the library presented to the College by the same bishop, who had been a fellow there; and it may be perhaps portions of the library of Walter de Merton himself. For it is implied in the Statutes given to the College by Walter De Merton, in 1270, that books were to be had within the walls of the building. He orders, for example, that the *Grammaticus* of the house, the Master of Grammar resident in the College, should have *librorum copia*, a plentiful supply of books for his purposes, as well as *alia sibi necessaria*. And for the reader at meal-time, he directs that

there shall be provided *aliquid quod ad scholarium instructionem et edificationem pertineat,* something that might tend to instruct and edify the scholars.

Before the construction of the Library by Bishop Rede, the books of the College would be kept in chests. Such was the custom then and later. Antony à Wood speaks of the *cistæ olim in Bibliothecâ Mertonensi repositæ,* filled with Mathematical and Astronomical works by members of the College; books, he says, *quos barbara superiorum seculorum pietas, tanquam Artis Magicæ proseminatores, reique propteredà Christianæ damnosos, execrari non destitit.* (In the same place he speaks of the loss out of the Library, from the same cause, of the *instrumenta Mathematica, qualia sunt Astrolabia, radii, quadrantes, &c., denique integrum clarissimæ Scientiæ Armamentarium.*)

Walter de Merton was born soon after 1200, and died Oct. 27, 1277. He was twice Lord High Chancellor of England: first in 1258, under Henry III.; and again in 1272, for a short time, under Edward I.; in 1274 he was made Bishop of Rochester, occupying the See only three years. A portrait of him exists in the Bodleian Library, and has been copied in Ackermann's History of Oxford. It shews a countenance of a cast modern, rather than mediæval; refined, thoughtful and intelligent; the hair and eyebrows snowy white.

As a preliminary to the foundation of his College in Oxford, he established at Malden, in Surrey, a *Domus Scholarium de Merton,* an institution which in addition to educational and other work at Maldon was, in accordance with rules laid down by himself, to supply means out of its endowments for the sustenance of twenty scholars frequenting the Schools at Oxford, or anywhere else where learning for the time being might be flourishing. Then after the lapse of six years, in 1270, the *Domus Scholarium de Merton,* intended to aid in the sustenance of scholars at Oxford, is removed to that place; and a reason is implied why it was not in the first instance established there. The date 1264 is spoken of as *tempus turbationis in regno Angliæ subortæ,* an unsettled time,—as indeed it was, the struggle of the Barons with the King still going on. But now, 1270 is described as a period of peace (*nunc tempore pacis*); and therefore the *Domus Scholarium de Merton* is removed to Oxford, where the founder had desired and intended it to be. A power of removal, however, to any other locality, should circumstances so

require, was still given to the Society,—in anticipation probably of troublous times occurring again.

Nine years ago,—viz: in 1864, the memorable year of the Shakspeare Tercentenary,—the members of Merton College celebrated, on the 14th of June, the Sexcentenary of the foundation of their Society. How many regions are there outside of happy England in which Societies, literary, political, or otherwise, can shew a continuous corporate existence of six hundred years?

Three hundred years before the birth of Shakspeare, the *Domus Scholarium de Merton* existed, in embryo at least, at Oxford. When the poet rambled about Oxford, as we know he did, in his journeyings between London and Stratford, and looked in at the gateways of the several Colleges, as any inquisitive stranger would do at the present day, he would, in point of antiquity, regard Merton College, the identical Merton College which we see now, as *we* should regard a building or institution founded in the middle of the reign of Elizabeth. In Shakspeare's time, the days of the king who followed next after John would seem tolerably remote, but easily grasped and reproduced with a vivid reality by such a mind as Shakspeare's, as we can see in his tragedy of King John.

But the chief point of interest about Merton College is not the antiquity of the Society of which it is the home. The great distinction of the College is this: that it was the first embodiment in Europe of a new system of training for the youth of a country—the system which has, by successive steps, developed into what is known as the English College or University system, which among the educational systems of Europe continues to be unique.

Walter de Merton is held to have been an enlightened innovator in respect of education. When he lived, what are technically called "Universities" had been instituted at different points on the continent of Europe for about fifty or eighty years (reckoning from the time of Abelard's lectures in Paris). They were incorporations of scholars and teachers, privileged by emperors, kings or popes, with peculiar jurisdiction in the towns where they were respectively situated; which towns, as a rule, became the centres of great disorder. Young people flocked in thousands to attend the lectures of this teacher and that. In this way Oxford was thronged. In the meantime, discipline was feebly maintained. Brawls and fights (battles they might even be called in some cases) were the order of

the day. The town came into collision with the gown; Welshmen, Scotchmen, North-of-England men, with their fellow-islanders, whose homes happened to be south of the Trent. Rival instructors also generated rival factions among the youth; and not alone on points of ordinary secular learning. Differences of view in regard to religious questions and matters of conventual discipline aggravated the discord. Each great monastery of the British Islands had a class of its foster-children studying at the place, and these partook of the prejudices of the houses which sustained them. Devotees of the different orders of friars were thus arrayed one against the other: Benedictines against Augustinians; Cistercians against Carmelites; Dominicans against Franciscans. The University, in fact, was dominated in 1264 by the monastic orders.

The subjects of study were nominally good and comprehensive: the seven liberal arts, as they were called: the Trivium, *i. e.*, the study of classical literature, rhetoric and dialectics; the Quadrivium, *i. e.*, arithmetic, geometry, astronomy and music: but almost every one of these was pursued to an extent that we should now consider only elementary, and in a spirit which we should call excessively pedantic and narrow. The logic of Aristotle, received in an abridged, condensed form, not directly from the original Greek, but through a meagre translation in Latin from the Arabic, was applied crudely to all the stock topics of discussion, theology included. And this was held to be the highest exercise of the human mind. Doubtless the gifts of intellect were distributed then as now liberally throughout communities; and, failing really rational and fruitful subjects of speculation, matters the most irrational and useless—albeit extremely ingenious and subtle—exercised the wits of clever men. Consequently, the literary remains of the period referred to, impress moderns most unpleasantly. Two dialogues of the celebrated Abelard, named above, the all-accomplished Master as he was styled in his day,—one between a Christian and a Jew, the other between a Christian and a Philosopher,—may be taken as specimens. And thus speaks one who has looked into them: "Words are wanting," he says, "to express the utter insipidity and absence of all taste, energy or life which these spiritless compositions display: nor can we," he adds, "concede to them the praise of being written in Latin which will bear the test of strict examination." (*English Cyclop.*, art. ABELARD.)

When at a later date the metaphysical, physical and ethical works of Aristotle were discovered and studied,—these, with his Logic, read no longer in translated abstracts but in the original Greek, had a marked effect on the philosophy and science of the universities, expanding and elevating both, and purging both from several errors. (Nevertheless, at the Reformation period, Holbein, in a well-known picture, "Christus Vera Lux," represents Aristotle and Plato plunging into a dark abyss, pope, cardinal, bishop and professor all following them with closed eyes, each holding on to the other.)

Oxford in 1264 was not the beautiful Oxford which is to be seen to-day—a widespread city, rendered conspicuous from afar by dome and turret and spire; remarkable, when you enter it, for streets exceeding fair and broad, traversing it in various directions, flanked every here and there with long lines of collegiate buildings, reverend and picturesque, each disclosing within its vaulted gateway, court and cloister and velvety grass-plot, hall and chapel and library; each, provided in its farther recesses with a pleasaunce of its own, more or less extensive, of lawns and gardens and groves, vocal with birds, fragrant with sweet-scented shrubs and flowers; tranquil paradises, scenes of trim order and comeliness, kept up from year to year with minute, unremitting care. The Oxford of 1264 was, on the contrary, a hard-featured walled town, with few contrivances for luxury or learned ease, its limited area chiefly filled with dingy hostels or lodging-houses, in which, under the melancholy tutelage of friars of orders and colours manifold, were herded at night the unkempt youth who flocked to the place from all parts of the kingdom and from abroad, and who during the day were to be seen hastening to and from the lecture-rooms of the various *doctores;* to and from the services in the several churches, thronging the narrow streets and lanes, jostling against each other and against the settled inhabitants of the place, sometimes not without mischievous intent. Mingling with the mass would doubtless be vagrants and charlatans innumerable, native and foreign, who seldom fail to find their way to places where inexperience and folly seem likely to yield a harvest.

Here then it was, amidst surroundings, animate and inanimate, such as these, that Walter de Merton commenced the great experiment which finally developed into the modern English College or University system.

We shall not enter into the discussion relating to the foundation of University College in Oxford, and Balliol, both of which in some

works on Oxford are made to take precedence of Merton in point of antiquity. A legend, now exploded, assigns Alfred the Great as the founder of University College. The real author of its existence appears to have been William of Durham, certain moneys left by whom were appropriated in 1280, and more distinctly in 1311, to the foundation of a House plainly after the pattern of Merton, so far as relates to the matter of residence. And Balliol seems to have taken the form of a College or House for the accommodation of a society of scholars in 1282. Previously, since 1268, sixteen scholars had been charitably sustained at Oxford by John de Balliol (father of John Balliol, the ill-starred King of Scotland); but no house was appropriated to their use until 1282, when, probably after the pattern of Merton again, so far as concerned residence, a building was hired for them in Horsemonger lane, afterwards called Canditch, in the parish of St. Mary Magdalene.

I now give very briefly the leading distinctive features of the new foundation of Walter de Merton, as described by those who have closely examined the original constitution of the College. These appear to have been (1) the union of a discipline resembling, without being really, the monastic, with secular studies; (2) the recognition of Education, rather than ceremonial or ritual duties, or the so-called religious, *i. e.*, monkish, life, as the proper function of the Society; and (3) the liberal provision for the future adaptation of the new system to the growing requirements of the age. (Although I possess and have read the original statutes of Merton, I prefer giving their purport and drift as summarized in an article on the Sexcentenary of 1864 in a London *Times* of the day. I make further use of the same authority below.)

The inmates of the College were to live by a common rule, under a common head; but they were to take no vows and were to join none of the Monastic orders. (As we have already seen, most of the students hitherto frequenting the University had been "sent up" by one or other of the Monastic institutions, and so were committed to the ideas of one or other of the Monastic orders.) They were to study Theology; but not until they had gone through a complete course of instruction in Arts; and they were to look forward, some of them certainly, to being secular clergy, that is, parochial clergy, as distinguished from Regulars or Monks; but many of them also to the public service of the State and the discharge of other important duties in the great lay world.

They were maintained by endowments, but the number of scholars was to increase as the value of the endowments increased; and they were empowered not only to make new statutes, but even, as we have already seen, to change their residence in case of necessity.

The effort of mind required to make such innovations, worked out as they were with remarkable foresight in details, can hardly be estimated at the present day.

Nor did the new regulations of Walter de Merton fail to produce the results intended. The Monastic orders soon began to lose their ascendancy in the University; secular learning began to gain upon the casuistry of the rival religious controversialists; the science of Medicine established itself by the side of Law; and other founders, following, as we have already in some degree seen, the wise example of Walter de Merton, and borrowing the *Regula Mertonensis*, gradually transformed Oxford from a mere seminary for monks, which it was fast becoming, into a seat of national education.

A like change in the character of Cambridge speedily took place. When St. John's College in that University first assumed the position of an educational institution, in 1280, from having been an Augustinian Hospital or Monastery, its statutes were formed after the model of those of Merton. Those of Peterhouse, likewise in the same University, were brought into conformity with the same pattern by Bishop Montague, of Ely, in 1340.

The original statutes of the College of Merton thus, as Chambers, in his History of the Colleges and Halls of Oxford, observes, affords an extraordinary instance of a matured system; and with very little alteration they have been found to accommodate themselves to the progress of science, discipline and civil economy in more refined ages.

And for many a generation Merton held the foremost place among the colleges. The brilliant catalogue of her reputed members includes some of the most illustrious names of the thirteenth and fourteenth centuries. It may be doubtful whether Duns Scotus and Wycliffe should be numbered among them, though there are strong reasons for believing that both once resided at Merton; but Roger Bacon, the Doctor Mirabilis, Bradwardine, the Profound Doctor, and Occam, the Invincible Doctor, have always been claimed as undoubted alumni; and in later times Hooper and Jewell, the reforming Bishops; Bodley, the founder of the library bearing his name; Sir Henry Savile, founder of Lectureships in the University on Geometry and

Astronomy; and Harvey, the discoverer of the circulation of the blood, adorned this most ancient Society. In regard to Duns Scotus, I give the testimony of Johannes ab Incarnatione, from my own folio copy of that learned friar's edition (Conimbricæ, Nonis Martii, in die Beati Thomæ Aquinatis, Anno Domini, 1609,) of the *Oxoniense Scriptum* of Duns *in Librum primum Sententiarum Magistri Petri Lombardi.* He says: *Is adolescens, seu fere puer, ordine Seraphici Patris* [*Francisci*], *et regulam profiteretur Oxonii in provincia Angliae, inibi studio artium liberalium quamprimum destinatur.* And then, after relating his removal to Paris for the study of Theology, he adds: *Inde ad suos regressus in Angliam Oxonii in Collegio Mertonensi ante annum etiam aetatis suae vigesimum sacrae Theologiae lector instituitur. Ibique quatuor Sententiarum libros* [*P. Lombardi*] *publice est interpretatus.*

From the Opus Magus of Roger Bacon above mentioned, I will here add a brief utterance in the true Mertonian spirit, showing that he discerned clearly the defective condition of education as conducted by the majority of his contemporaries, and desired its reform.

"There never was such an appearance of wisdom," he says, "nor such activity in study in so many faculties, and so many regions as during the last forty years, [he is writing in the time of Walter de Merton himself,] for even the doctors [the public teachers] are divided in every state, in every camp, and in every burgh, especially through the two studious orders [Dominicans and Franciscans]; when neither, perhaps," he continues, "was their ever so much ignorance and error. The students," he says, "languish and stupify themselves over things badly translated; they lose their time and study: appearances only hold them; and they do not care what they know, so much as to maintain an appearance of knowledge before the insensate multitude." And again in the same work, the Opus Magus, in respect of Aristotle, he ventures to express such heresy as this: "If I had power over the books of Aristotle, I would have them all burnt, because it is only a loss of time to study them, a cause of error and multiplication of ignorance beyond what I am able to explain." He refers of course to the wretched translations and abstracts which were then alone generally accessible; but it is curious to observe that his view of the Aristotelian philosophy was strongly confirmed three centuries later by his still greater namesake, Lord Bacon, who said, after many years' devotion to Aristotelianism, that it was "a philo-

sophy only strong for disputations and contentions, but barren of the production of works for the benefit of the life of man." (Quoted in Hill's English Monasticism, p. 409.)

I hasten now to shew a certain subtle connexion existing between Walter de Merton's College and Canada; a connexion which, when I had detected it, helped to invest Merton College, in my view at least, with such a peculiar interest.

It happens that three distinguished governors in Canada have been Merton men; and each of them has been conspicuously concerned either in the founding or else in the actual promotion of a system of University Education for the sons of the Canadian people. And it will be seen, I think, in the case of each of these Canadian rulers, that he, either consciously or unconsciously, transplanted to this side of the ocean, and handed on, so far as surrounding circumstances allowed, the Merton traditions — the Merton spirit — in relation to sound learning and wholesome knowledge.

General Simcoe was a member of Merton College. Lord Elgin was a Fellow of Merton. Sir Edmund Head was a Fellow and Tutor of Merton.

I propose to give a sentence or two from the correspondence or public declarations of each of these now historic personages, on the subject of higher Education in Canada; that you may observe for yourselves how the animus of Walter de Merton of the year 1264 still lived and breathed in each of them.

I.—I begin with portions of the correspondence of Governor Simcoe, preserved in the Parliamentary Library at Ottawa and elsewhere. Governor Simcoe was appointed to the newly-constituted Province of Upper Canada in 1791. He had previously seen much active service on this continent during the American Revolutionary war, and had become well acquainted with the character and spirit of colonial communities. Successively an officer in the 35th and 40th regiments, he afterwards had command of a provincial light cavalry corps, known as the Queen's Rangers, which became famous for its efficiency. In all accounts of the struggle for independence the name of the gallant leader of the Rangers repeatedly occurs. In 1790 he was chosen to represent the borough of St. Mawes, near Falmouth, in the county of Cornwall, in the House of Commons, in which capacity he took part in the debates on the Quebec bill in 1791. Even before his departure from England to undertake the oversight

of the virgin province, Governor Simcoe imparted to Sir Joseph Banks, President of the Royal Society, his hope that he should be able to establish therein, among other means of civilization, a University. "A college of a higher class," he says to Sir Joseph, "would be eminently useful, and would give a tone of principles and of manners, and would be of eminent support to Government."

The whole letter to Sir Joseph Banks will repay perusal. We accordingly give it. The sanguine writer, it will be seen, held the opinion that British institutions might, by their evident superiority, when honestly and honourably worked, have their effect even on the United States; might ultimately even win the recently revolted colonies back to the rule of the old mother country. Every year, however, that slipped away without beginning the experiment, made the chance of such a consummation less. The letter is dated January 8th, 1791. It begins:

"Sir,—I was much disappointed that the variety of business in which my good friend Sir George Yonge was engaged, and my own avocations, prevented me from having the honour of being introduced to you, as soon as it was generally made known that I was to be appointed to the government in Upper Canada. But, sir, as it is possible that I may be hurried off, without having much time to spare, in endeavouring to procure in person, such advantages for the community I am to superintend, as must necessarily result from the great encouragement this nation under His Majesty's auspices affords to those arts and sciences which at once support and embellish our country, I am emboldened by letter to solicit that assistance from you, and on those subjects, which I venture to point out, preparatory to my return to London, when I shall hope to have the honour of frequent communication with you, and to avail myself of your ideas and patronage.

"The liberality of your character, the high station you fill, and the public principles which I apprehend that you entertain, leave upon my mind no hesitation of communicating to you, confidentially, my views, and the object which irresistibly impels me to undertake this species of banishment, in hopes that you will see its magnitude, and, in consequence, afford your utmost support to the undertaking.

"I am one of those who know all the consequence of our late American dominions, and do not attempt to hide from myself the impending calamity, in case of future war, because neither in council nor in the field did I contribute to their dismemberment.

"I would die by more than Indian torture to restore my King and his family to their rightful inheritance, and to give my country that fair and natural accession of power which an union with their brethren could not fail to bestow and render permanent.

"Though a soldier, it is not by arms that I hope for this result: it is *volentes in populos* only that such a renewal of empire can be desirable to His Majesty; and I think, even now (though I hold that the last supine five years, and every hour that the Government is deferred, detracts from our fair hopes)—even now, this event may take place.

"I mean to prepare for whatever convulsions may happen in the United States; and the method I propose is by establishing a free, honourable, British Government, and a pure administration of its laws, which shall hold out to the solitary emigrant, and to the several States, advantages that their present form of government doth not and cannot permit them to enjoy.

"There are inherent defects in the Congressional form of government. The absolute prohibition of any order of nobility is a glaring one. The true New-England Americans have as strong an aristocratical spirit as is to be found in Great Britain; nor are they anti-monarchical. I hope to have a hereditary Council, with some mark of nobility."

He then proceeds to speak of the locality which he expected to make the heart and centre of his new community, and of the name which its chief town was to bear.

"For the purpose of Commerce, Union, and Power," he says, "I propose that the site of the Colony should be in that great Peninsula between the Lakes Huron, Erie and Ontario, a spot destined by nature sooner or later to govern that interior world.

"I mean to establish a Capital in the very heart of that Country, upon the River la Tranche, which is navigable for batteaux one hundred and fifty miles, and near to where the Grand River, which falls into Erie, and others that communicate with Huron and Ontario, almost interlock. The Capital I mean to call Georgina. I aim to settle in its vicinity Loyalists who are now in Connecticut, provided that Government approve of the system. I am to have a Bishop, an English Chief Justice, &c."

He then observes that he is aware his views will be deemed chimerical by some in England. He is nevertheless confident of sympathy among many in the New England States.

"This, Sir," he says, "is the outline of my plan, and I trust it will force its way, notwithstanding what circumscribed men and self-interested monopolists may allege against it. It must stand on its own ground; for my extensive views are not what this Country is as yet prepared for, though the New England Provinces are by no means averse to them; and they are the strength of America."

And then he speaks of the alluring contrast, literary and political, which, if he can only obtain proper coöperation and help, his domain will present, when compared with the United States.

"Now, Sir," he continues to Sir Joseph Banks, "not to trespass on your time, you will see how highly important it will be, that this Colony (which I mean to shew forth, with all the advantages of British protectorate, as a better Government than the United States can possibly obtain), should, in its very foundations, provide for every assistance that can possibly be secured for the Arts and Sciences, and for every embellishment that hereafter may decorate and attract notice, and may point it out to the neighbouring States as a superior, more happy and more polished form of government. I would not, in its infancy, have a hut, nor in its maturity, a palace, built without this design.

"My friend, the Marquis of Buckingham," he next proceeds to say, "has suggested that Government ought to allow me a sum of money to be laid out for a Public Library, to be composed of such books as might be useful to the Colony. He instanced the Encyclopædia, extracts from which might occasionally be published in the newspapers. It is possible private donations might be obtained, and that it would become an object of Royal munificence.

"If any Botanical arrangement could take place [this project he knew it would be in Sir Joseph's power to promote,] I conceive it might be highly useful, and might lead to the introduction of some commodities in that country which Great Britain now procures from other nations. Hemp and Flax should be encouraged by Romulus."

Then comes the passage in which he moots the idea of a University, or College of high class, for the community which he is about to found, and to which I have already referred.

"In the literary way," he says, "I should be glad to lay the foundation of some Society that, I trust, might hereafter conduce to the extension of Science. Schools have been shamefully neglected. A College of a higher class would be eminently useful, and would

give a tone of principles and of manners that would be of infinite support to Government."

Then, after describing the surgeon who is to accompany him, and who he evidently thinks will be of use to him in conducting investigations in science, he concludes by promising to call on Sir Joseph when he comes up to town.

"Sir George Yonge," he says, "has promised my old surgeon, a young man attached to his Profession, and of that docile, patient, and industrious turn, not without inquisitiveness, that will willingly direct itself to any pursuit which may be recommended as an object of inquiry.

"I am sure, Sir, of your full pardon for what I now offer to you, from the design with which it is written; and I am anxious to profit from your enlarged ideas. I shall therefore beg leave to wait upon you when I return to London.

"I am, Sir, with the utmost respect,

"Your most obedient and faithful—

"Sir J. Banks, Bart., "J. G. Simcoe.

"President of the Royal Society.

"January 8, 1791."

From this letter it will appear that the organizer of Upper Canada fondly hoped, through British institutions honourably worked in his new province, to Anglicise the United States. He would have been amazed had he been told the day would come when the United States would Americanize the British islands. However, the policy of Governor Simcoe still in some degree governs English statesmen. We see his theory apparently pushed in our own day. For one thing, the distribution of titles of late years has increased. There are many persons in the parent state and elsewhere who expect that such distinctions, combined with the real freedom and more positive civilization and refinement resulting from British institutions within the Canadian Dominion will, if they do not in any way affect society in the United States, at least render the people of the Dominion itself so satisfied with their condition by comparison, that no desire will exist among them for amalgamation with their southern neighbours.

I next give portions of letters addressed by Governor Simcoe to Bishop Mountain, of Quebec. It will be seen from them that he had a very luminous forecast of the future of Canada, and that his plans in respect to it were those of a statesman. He several times refers to his project of a University for Upper Canada.

In a letter to the Bishop, dated Kingston, Upper Canada, April 30, 1795, he observes:

"Perhaps the constitution given to Upper Canada, however late, forms the singular exception to that want of preventive wisdom which has characterized the present times. The people of this Province enjoy the forms, as well as the privileges, of the British constitution. They have the means of governing themselves; and, having nothing to ask, must ever remain a part of the British empire; provided they shall become sufficiently capable and enlightened to understand their relative situation and to manage their own power to the public interest.

"Liberal education seems to me, therefore, to be indispensably necessary; and the completion of it by the establishment of a University in the capital of the country, the residence of the Governor and the Council, the Bishop, the heads of the law, and of the general quality of the inhabitants consequent to the seat of government—in my apprehension, would be most useful to inculcate just principles, habits and manners, into the rising generation; to coalesce the different customs of the various descriptions of settlers, emigrants from the old provinces [the United States] or Europe, into one form. In short, from distinct parts and ancient prejudices to new-form, as it were, and establish one nation; and thereby to strengthen the union with Great Britain, and to preserve a lasting obedience to His Majesty's authority. The income contemplated for such an establishment is certainly, of itself, too contemptible to be withheld from the prosecuting of so great an object, on any views of expense."

In accordance with the usage then almost universal, he takes for granted that the professors will be clergymen; and he desires that they shall be in the first instance Englishmen; but he makes some shrewd distinctions: he does not desire the presence of over-refined, over-cultivated clergymen. He was acquainted with the character of the New-England people. The inhabitants of the young province of Upper Canada would be, he knew, of a similar temper, and would require to be ministered to, educationally and otherwise, by competent and earnest men indeed, but men also somewhat homely and humble-hearted. He had likewise doubtless often witnessed the bad effect of incompatibility of manners between pastors and flocks in the mother country.

"I naturally should wish," he says, "that the clergy necessary for offices in the University, in the first instance, should be Englishmen,

if possible, (conforming therein to Mr. Secretary Dundas's opinion, and indeed, in this respect, to my own). But as in an object of such magnitude no explanation can be too minute which fairly and distinctly elucidates these points, which ought not to be misunderstood, I only refer to your lordship's slight experience of the habits and manners of the American settlers, to say how very different they are from those of Great Britain; and how unlikely it is for clergymen, educated in England, with English families and propensities, habituated in every situation to a higher degree of refinement and comfort than can be found in a new country, or possibly anywhere without the precincts of Great Britain—how unlikely it is that such persons should obtain that influence with their parishioners which may effectually promote the object of their mission."

And he looks at the matter, likewise, from the politician's point of view, regarding the Church and its ministers as instruments of government.

"In the infancy of such a government as that of Upper Canada," he observes, "and in the general indisposition of these times to all restraint, it seems to be of peculiar importance to prevent the public interest, both in Church and State, from suffering through any ill-will or disregard which the King's subjects may bear to those persons who are in any manner concerned in its administration.

"On the other hand," he continues in the same strain, "I am persuaded if, at the outset, a few pious, learned men, of just zeal and primitive manners, shall be sent to this country, with sufficient inducement to make them support this honourable banishment with cheerfulness—and that in the first instance your lordship shall not too strenuously insist upon learning as a qualification for ordination, where there are evident marks of religious disposition and proofs of morality—I am confident the rising generation will be brought up competently learned and properly endued with religion and loyalty; and it is probable that they may at least be equal to those of Connecticut in this continent, whose clergy are, in general, inferior to none in those points of learning and of acquisition in the dead languages, which may be generally considered as the necessary materials and instruments of their sacred profession.

"In short, my Lord," he then adds, "if the maintenance of religion and morality be merely considered in a commercial light, as so much merchandise, the bounty which I have proposed, and most earnestly

implore may be for a while extended to it, will augment that produce on which the union of this country with Great Britain and the preservation of Her Majesty's sovereignty may ultimately depend. I am almost ashamed of using this metaphorical language, but it is that of the age."

He then gives his experience as derived from a late excursion through the settlements; and he expresses the fear, if institutions of education and religion continue to be withheld, the inhabitants will at no distant day be desirous of migrating back again to the United States.

"There has nothing," he says, "in my late progress, given me equal uneasiness with the general application of all ranks of the most loyal inhabitants of the Province, that I would obtain for them churches and ministers. They say that the rising generation is rapidly returning to barbarism. They state that the Sabbath, so wisely set apart for devotion, is literally unknown to their children, who are busily employed in searching for amusements in which they may consume that day. And it is of serious consideration, that on the approach of the settlements of the United States to our frontiers, particularly on the St. Lawrence, these people, who by experience have found that schools and churches are essential to their rapid establishment, may probably allure many of our most respectable settlers to emigrate to them, while in this respect we suffer a disgraceful deficiency."

He next alludes to some views of his in regard to the possible future restoration of unity between two religious parties subsisting in the community both of the United States and Upper Canada, and the happy political results that might accrue from such restoration. His views on this head he strongly adheres to, although he is aware they are in danger of being misapprehended.

"A principal foundation," he says, "of the wise and necessary friendship of Great Britain with these her legitimate descendants, I have heretofore pointed out, as to be deduced from the most intimate union and reconcilement between the English Episcopal Church and that of the Independent form of worship used in the New England Provinces—an emanation from the English Church, as all their authors avow, and principally originating from the harsh measures of the secular power which the English Church once exercised, but which is now no more. Though my ideas on this subject, my Lord,

were probably misunderstood, and the lukewarm spirit of the times (had I been even called on for their explanation) would, doubtless, have slighted my reasons as merely struck out in the heat of imagination, and not, as they are, the sober deductions of much thought and of personal observation, yet nothing has happened since I left England in the least to invalidate, to my own conception, the policy of the measures I then proposed; and as far as may be now in the power of His Majesty's Ministers, I most earnestly hope that what remains will be effected—that is, by giving the means of proper education in this province, both in its rudiments and in its completion, that from ourselves we may raise up a loyal and, in due progress, a learned clergy, and which will speedily tend to unite not only the Puritans within the Province, but the clergy of the Episcopal Church however dispersed, to consider with affection the Parent State, to form, corroborate and unite, within the United States, that powerful body of people who naturally must prefer the alliance of Great Britain to that of France, who are mostly members of the Episcopal Church, and on all sides to bring within its pale in Upper Canada, a very great body of denominationalists who, in my judgment, as it were, offer themselves to its protection and re-union." (He appears to have supposed that by certain relaxations on the part of the Episcopal authorities on both sides of the line, the breach between the descendants of the so-called "pilgrim fathers" and the mother-church might be healed, and a universal good will towards England throughoutthe North American continent be established.)

"These objects," he again repeats, "would be materially promoted by a University in Upper Canada, which might, in due progress, acquire such a character as to become the place of education to many persons beyond the extent of the King's Dominions."

As suggestive of a precedent for Government aid to his University projected for Upper Canada, he refers to the grant promised (but never made) to Bishop Berkeley for a College in Bermuda, in 1725. He also hints that the Society for the Propagation of the Gospel would do well also to patronize the undertaking, as likely to aid powerfully in carrying out the benevolent designs of the Society in regard to the aborigines of North America.

"If I recollect, my Lord," he says to Bishop Mountain, "Parliament voted £20,000 for the erection of the University proposed by Bishop Berkeley, in the Bermudas. The object, not to speak dis-

respectfully of so truly respectable a prelate, was certainly of trivial importance to what I now propose." And he adds: "The labours of the Society for the Propagation of the Gospel are visionary, as applicable to the conversion of the American Indians in their present state; but would be of most essential benefit by promoting a University, which, if placed in the part I meditate, would, in its turn, have great influence in civilizing the Indians, and, what is of more importance, those who corrupt them."

He then puts it generally to the Church of the mother country, that its members ought to assist in establishing a University in the Colony, inasmuch as such an institution would be a bulwark therein against the encroachments of dangerous principles which everywhere were endangering society. The term "minute" which he uses, was probably caught from the title of Bishop Berkeley's book, the "Minute Philosopher," directed against the free-thinkers of his day.

"The Episcopal Church in Great Britain," he says, "from pious motives as well as policy, are materially interested that the Church should increase in this Province. I will venture to prophesy its preservation depends upon a University being erected therein, as one of the great supports of true learning against the minute, the plebeian, the mechanical philosophy which, in the present day, from the successful or problematical experiments of ill professors in rational inquiries, has assumed to itself the claim of dictating in religion and morality, and, in consequence, now threatens mankind with ruin and desolation."

The old Universities of England, he suggests to the Bishop, ought also to be applied to for help.

"The Universities of England, I make no doubt," he says, "would contribute to the planting of a scion from their respectable stock in this distant colony. In short, my Lord, I have not the smallest hesitation in saying that I believe, if a Protestant Episcopal University should be proposed to be erected even in the United States, the British nation would most liberally subscribe to the undertaking."

Again, he refers to his project in a letter to Bishop Mountain, under date of "Navy Hall, October 16, 1795," thus:—"My views in respect to a University are totally unchanged; they are on a solid basis, and may or may not be complied with, as my superiors shall think proper; but shall certainly appear as my system to the judgment of posterity."

And once more, to the same correspondent, writing from "York," on the 28th of February, 1796 (the year of his recall), he says:

"I have scarcely the smallest hope of this Government being supported in the manner which I cannot but think proper for the national interests, and commensurate with its established constitution. In particular, I have no idea that a University will be established, though I am daily confirmed in its necessity. I lament these events, from the duty I owe to my King and country, and have only to guard, that no opinion of mine be interpreted to promise beneficial effects, when the adequate causes from which they must originate are suffered to perish or are withheld."

It will be seen, I think, from the tone of the extracts given, that Governor Simcoe, the founder and organizer of Upper Canada, either consciously or unconsciously, was a genuine son of Walter de Merton: (1) in his desire to secure in perpetuity an enlightened training in matters of religion, in manners, in science and practical knowledge, for the community which he had initiated; and (2) in his anxiety to make the institution of education which was mainly to help forward the great work, in the generations that should follow after him, comprehensive and national, aiming, with this object in view, to bring to an end, so far as in him lay, among the people over whom he presided, religious feuds, and irritating, clashing interests.

II.—I turn now to Lord Elgin, Governor-General of Canada from 1847 to 1855; who, before succeeding to the title by the unlooked-for death of an elder brother, was a Fellow of Merton College in the University of Oxford.

I have not been able to lay my hand on any reported speeches of his, having direct reference to the University of Toronto. I have been obliged on this occasion to content myself with portions of other productions of his, shewing his views in regard to high education. It will be seen from these that in a Canadian Governor again Walter de Merton had a genuine representative.

Even while yet a student, but one very near his degree, we have him offering in a private letter to his father a criticism of great weight on the working of the English University system as he found it at Oxford in 1832. His conviction, like that of Roger Bacon of Merton before him, was that education should be no thing of seeming, but as real as possible. His remarks may with advantage be borne in mind.

"In my own mind I confess," he says to his father, "I am much of opinion that college is put off in general till too late; and the gaining of *honours*, therefore, becomes too severe to be useful to men who are to enter into professions. It was certainly originally intended that the degrees which require only a knowledge of the classics should be taken at an earlier age, in order to admit of a residence after they were taken, during which the student might devote himself to science or composition, and those habits of reflection by which the mind might be formed, and a practical advantage drawn from the stores of knowledge already acquired. By putting them off to so late an age, the consequence has been, that it has been necessary proportionably to increase the difficulty of their attainment, and to mix up in college examinations (which are supposed to depend upon study alone) essays in many cases of a nature that demands the most prolonged and deep reflection. The effect of this is evident. Those who, from circumstances, have neither opportunity nor leisure thus to reflect, must, in order to secure their success, acquire that kind of superficial information which may enable them to draw sufficiently plausible conclusions, upon very slight grounds; and of many who have this *form* of knowledge, most will eventually be proved (if this system is carried to an excess) to have but little of the *substance* of it."

The real educational results, that is, to the nation, would be greater and better, if the merely preparatory studies of young men could be made to end earlier, and the time thus gained be converted into an interval calmly and seriously devoted to philosophic inquiry in various directions, by those intended for the professions and others having a genuine love of learning, irrespective of emolument. This is a thought which opens up a noble view of what a University might be.

At the Michaelmas examination of 1832, Lord Elgin was placed in the first class in classics, and common report spoke of him as "the best first of his year." And not long afterwards he was elected a Fellow of Merton.

In Walrond's Memoir, few letters of Lord Elgin are given of a very early date. But we are told that after leaving college, he kept up a regular correspondence on abstruse questions with his brother Frederick, still at Oxford. Some of these letters should have been given for the benefit of students.

Before his appointment to the Governor-Generalship of Canada, Lord Elgin had in Jamaica, where he was Governor in 1842, a field

for educational experiments, of the rudest kind; to the cultivation of which he at once addressed himself.

"The object," says Mr. Walrond, "which Lord Elgin had most at heart was to improve the moral and social condition of the Negroes, and to fit them, by education, for the freedom which had been thrust upon them; but, with characteristic tact and sagacity, he preferred to compass this end through the agency of the planters themselves. By encouraging the application of mechanical contrivances to agriculture, he sought to make it the interest not only of the peasants to acquire, but of the planters to give them, the education necessary for using machinery; while he lost no opportunity of impressing on the land-owning class that, if they wished to secure a constant supply of labour, they could not do so better than by creating in the labouring class the wants which belong to educated beings."

This advocacy of the use of machinery with a view to promoting cultivation of mind in those who must superintend its working, is interesting. In a letter to the Colonial Minister Lord Elgin touches upon the matter himself.

"In urging the adoption of machinery in aid of manual labour," he says, "one main object I have had in view has ever been the creation of an aristocracy among the labourers themselves; the substitution of a given amount of skilled labour for a larger amount of unskilled. My hope is," he continues, "that we may thus engender a healthy emulation among the labourers, a desire to obtain situations of eminence and mark among their fellows, and also to push their children forward in the same career. Where labour is so scarce as it is here, it is undoubtedly a great object to be able to effect at a cheaper rate by machinery, what you now attempt to execute very unsatisfactorily by the hand of man. But it seems to me," Lord Elgin then observes, "to be a still more important object to awaken this honourable ambition in the breast of the peasant, and I do not see how this can be effected by any other means. So long as labour means nothing more than digging cane holes, or carrying loads on the head, physical strength is the only thing required; no moral or intellectual quality comes into play. But, in dealing with mechanical appliances, the case is different; knowledge, acuteness, steadiness, are at a premium. The Negro will soon appreciate the worth of these qualities, when they give him position among his own class. An indirect value will thus attach to education.

"Every successful effort made by enterprising and intelligent individuals to substitute skilled for unskilled labour; every premium awarded by societies in acknowledgment of superior honesty, carefulness, or ability, has a tendency to afford a remedy the most salutary and effectual which can be devised for the evil here set forth."

And again he says in a despatch home, "So long as the planter despairs—so long as he assumes that the cane can be cultivated and sugar manufactured to profit only on the system adopted during slavery—so long as he looks to external aids (among which I class emigration,) as his sole hope of salvation from ruin—with what feelings must he contemplate all earnest efforts to civilize the mass of the population? Is education necessary to qualify the peasantry to carry on the rude field operations of slavery? May not some persons even entertain the apprehension, that it will indispose them to such pursuits? But let him, on the other hand, believe that by the substitution of more artificial methods for those hitherto employed, he may materially abridge the expense of raising his produce, and he cannot fail to perceive that an intelligent, well-educated labourer, with something of a character to lose, and a reasonable ambition to stimulate him to execution, is likely to prove an instrument more apt for his purposes than the ignorant drudge who differs from the slave only in being no longer amenable to personal restraint."

"It is impossible," observes the biographer of Lord Elgin, in a note on the above, "not to be struck with the applicability of these remarks to the condition of the agricultural poor in some parts of England, and the question of extending among them the benefits of education."

The same remarks might be pondered also advantageously by those who entertain the fear that a good educational training, for which such facilities exist amongst us, and for which in the future even greater will exist, will render men disinclined to, and in fact incapacitated for, the work which must be done on Canadian farms, if a home supply of food and clothing material for the population of the country is to be maintained. The probability, on the contrary, is that, gradually hereafter, the effect of a universal educational training, of a judicious kind, and not pushed beyond the point indicated by common sense, will be to render agricultural work in the highest degree inviting to a due proportion of the community; and light in numerous respects where now it is heavy and most weary to the bodily powers.

Like his predecessor, Governor Simcoe, and like Walter de Merton, Lord Elgin did not regard secular education as all-sufficient. He ever took into consideration the religious portion of men's nature. We have a clue to his principles on this point in an extract from a memorandum of his on a systematic course of study for degree, given us by his biographer. It is characteristic of the student James Bruce, and of the mature man Lord Elgin. "Ancient History," he writes, "together with Aristotle's Politics and the ancient orators, are to be read in connection with the Bible history, with the view of seeing how all hang upon each other and develop the leading schemes of Providence." The various branches of mental and moral science he proposes, in like manner, to hinge upon the New Testament, as constituting, in another line, the history of moral and intelligent development.

The sympathies of Lord Elgin, as Governor of Jamaica, as Governor-General of Canada, and as Governor-General of India, were entirely with those who believe (to adopt the words of the Vice-President of the Committee of Privy Council on Education, Mr. W. E. Forster), that, "while it is a great and a good thing to know the laws that govern this world, it is better still to have some sort of faith in the relations of this world with another; that the knowledge of cause and effect can never replace the motive to do right and avoid wrong; that . . . Religion is the motive power, the faculties are the machines; and the machines are useless without the motive power." But, as a practical statesman, Lord Elgin felt that the one kind of education he had it in his power to forward directly by measures falling within his own legitimate province; while the other he could only promote indirectly, by pointing out the need for it, and drawing attention to the peculiar circumstances of his government respecting it.

The persons in the mother country and among ourselves who maintain an agitation in favour of the educational arrangements of former centuries, ignore the facts of modern society, which have been brought into being, not without Providential supervision. It has become impossible now for governments and governors to insist on particular beliefs in communities, however possible it may have been for them to do so once, and however right and perhaps beneficial it was for them to do so then. From the necessity of the case, the modern Cæsar must confine himself to the things of Cæsar. It does not

follow that the modern Cæsar is indifferent to the things of God. For the things of God, so far as man may therein co-operate, Cæsar may be held to believe that other agencies more direct than his own have been ordained; and that for him it remains solely to approve and to encourage, without dictating. Walter de Merton worked out his reform in the national education of England by quietly ascending to a sphere above that occupied by "eremites and friars, black, white and gray," who sought to assert themselves in an exaggerated degree. Somewhat similarly now, in an era of intellectual and spiritual ferment, governments find it essential to just action in respect of many mundane matters, to maintain themselves at an altitude where the air is, comparatively, serene.

We have an utterance of Lord Elgin's, containing words of most wholesome drift, educationally, in a lecture to the Mercantile Library Association at Montreal, in 1848. He said: "The advantages of knowledge, in a utilitarian point of view, the utter hopelessness of a successful attempt on the part either of individuals or classes to maintain their position in society if they neglect the means of self-improvement, are truths too obvious to call for elucidation. I must say that it seems to me that there is less risk, therefore, of our declining to avail ourselves of our opportunities than there is of our misusing or abusing them; that there is less likelihood of our refusing to grasp the treasures spread out before us, than of our laying upon them rash and irreverent hands, and neglecting to cultivate those habits of patient investigation, humility and moral self-control, without which we have no sufficient security that even the possession of knowledge itself will be a blessing to us." . . . . And again, in the same strain: "God has planted within the mind of man the lights of reason and of conscience, and without it [*i. e.*, outside of it] He has placed those of revelation and experience; and if man wilfully extinguishes those lights, in order that, under cover of the darkness which he has himself made, he may install in the sanctuary of his understanding and heart, where the image of truth alone should dwell, a vain idol, a creature of his own fond imaginings, it will, I fear, but little avail him, more especially in that day when the secrets of all hearts shall be revealed, he if shall plead, in extenuation of his guilt, that he did not invite others to worship the idol until he had himself fallen prostrate before it."

In a note on the above lecture, Sir F. Bruce thus writes: "A knowledge of what he [Lord Elgin] was, and of the results which he

in consequence achieved, would be an admirable text on which to engraft ideas of permanent value on this most important question [of education], as helping to shew that to reduce education to stuffing the mind with facts, is to dwarf the intelligence, and to reverse the natural process of the growth of man's mind: that the knowledge of principles, as the means of discrimination, and the criterion of those individual appreciations which are fallaciously called facts, ought to be the end of high education." (Lord Elgin had said in the lecture: "Bear in mind that the quality which ought chiefly to distinguish those who aspire to exercise a controlling and directing influence in any department of human action, from those who have only a subordinate part to play, is the knowledge of principles and general laws." In illustration, he contrasted the qualifications of the mason and carpenter, and the architect; — of the steersman, and the master of the ship;—of the merchant's clerk, and the head of the establishment.)

We now come nearer home. I select a passage from a speech on "the great and important work of providing an efficient system of general education for the whole community," delivered at Toronto, on the occasion of laying the corner-stone of the Normal School in 1851. The statesman indoctrinated with the ideas (modernized) of Walter de Merton again appears. "I do not think that I shall be chargeable with exaggeration," Lord Elgin said, "when I affirm that it is *the* work of our day and generation; that it is *the* problem in our modern society, which is most difficult of solution; that it is the ground upon which earnest and zealous men unhappily too often and in too many countries meet, not to co-operate, but to wrangle; while the poor and the ignorant multitudes around them are starving and perishing for lack of knowledge. Well, then, how has Upper Canada addressed herself to the execution of this great work? How has she sought to solve this problem—to overcome this difficulty? Sir [addressing the Rev. Dr. Ryerson], I understand from your statements—and I come to the same conclusion from my own investigation and observation—that it is the principle of our common-school education system, that its foundation is laid deep in the firm rock of our common Christianity. I understand, sir, that while the varying views and opinions of a mixed religious society are scrupulously respected, while every semblance of dictation is carefully avoided, it is desired, it is earnestly recommended, it is confidently expected and hoped, that every child who attends our

common schools shall learn there that he is a being who has an interest in Eternity as well as in time; that he has a Father towards whom he stands in a closer, and more affecting, and more endearing relationship than to any earthly father, and that that Father is in heaven; that he has a hope far transcending every earthly hope—a hope full of immortality—the hope, namely, that that Father's kingdom may come; that he has a duty which, like the sun in our celestial system, stands in the centre of his moral obligations, shedding upon them a hallowing light, which they in their turn reflect and absorb—the duty of striving to prove by his life and conversation the sincerity of his prayers that that Father's will may be done upon earth, as it is done in heaven."

The successor of Lord Elgin was Sir Edmund Head, who was transferred from the government of New Brunswick to that of the whole of British North America, in 1854. Sir Edmund Head had been not only a Fellow at Merton, but also a Tutor there for several years. He had associated himself at an early period with the advocates of improvement in English education. Among the names of the Local Committee, at Oxford, in 1833, of the famous Society for the Diffusion of Useful Knowledge, the president of which was Lord Brougham, is to be seen that of "E. W. Head, Esq." This indicated in Sir Edmund the possession of much moral courage. The Society for the Diffusion of Useful Knowledge was in its day one of the best abused institutions in England; but it initiated, or rather it powerfully promoted, what had already in the Providential order of things been in other ways initiated, a great change in the intellectual condition of the British nation.

Sir Edmund Head was Lord Elgin's senior by a few years, and it had curiously happened that in the examination at which Lord Elgin won his Fellowship at Merton, Sir Edmund Head had taken part—a circumstance to which Lord Elgin gracefully alluded in his farewell speech at Quebec.

As introductory to my notice of this third Merton man who has been one of our rulers in Canada, I will give the passage in which Lord Elgin, on this occasion, spoke of the gentleman who was about to succeed him in the government. It was at an entertainment given by himself at Spencer Wood, near Quebec, on the eve of his final departure, in December 1854.

"I trust," Lord Elgin said, "that I shall hear that this house [the Governor-General's residence] continues to be what I have ever sought

to render it, a neutral territory on which persons of opposite opinions, political and religious, may meet together in harmony and forget their differences for a season. And I have good hope," he adds, "that this will be the case for several reasons, and, among others, for one which I can barely allude to, for it might be an impertinence in me to dwell upon it. But I think that without any breach of delicacy or decorum I may venture to say that many years ago, when I was much younger than I am now, and when we stood towards each other in a relation somewhat different from that which has recently subsisted between us, I learned to look up to Sir Edmund Head with respect, as a gentleman of the highest character, the greatest ability, and the most varied accomplishments and attainments."

(On this is a note in Walrond's memoir: "Sir Edmund Head, who succeeded Lord Elgin as Governor-General of Canada in 1854, had examined him for a Merton Fellowship in 1833. Those who knew him will recognize how singularly appropriate, in their full force, are the terms in which he is here spoken of.")

Sir Edmund Head visited Lord Elgin, at Toronto, in 1850. A letter to Earl Grey thus opens: "Toronto, Nov. 1, 1850. Sir H. Bulwer spent four days with us, and for many reasons I am glad that he has been here. He leaves us knowing more of Canada than he did when he came. I think, too, that both he and Sir E. Head return to their homes reassured on many points of our internal policy on which they felt doubtful before, and much enlightened as to the real position of men and things in this Province."

It may reasonably be conjectured that Lord Elgin's personal regard and high esteem, united with the weight of his judgment with the home authorities, helped forward Sir Edward's advancement to the high position of Governor-General of British North America.

III.—Sir Edmund Head was not, like his predecessor, a copious and fluent orator. Hence we have not been able readily to find in the local periodicals, reports of addresses of his on the subject of education. No formal Memoir of his Life has been published. His Letters would be worth reading; especially his confidential communications with the home authorities and his English friends, on Canadian affairs as they struck him. His Public Despatches must be valuable documents.

Like some others among the more remarkable of our Canadian Governors, he was probably not fully understood by those who *ex-officio*

were his near associates in the country; and his manner, which had a semblance of austerity, was against him. His time of life, too, when in Canada, was against him, the flexibility and sympathetic temper of youth having, in appearance, departed. He was, as I suppose, a student to the last. I remember the aspect of a small library of books which accompanied him to Toronto. It was a dingy-looking, ragged regiment of volumes, each tome shewing a large number of markers or slips of paper between the leaves, indicating passages at which the reader thought he should like sometime to look again. I had a great desire, I remember, to examine this collection.

That Sir Edmund Head was no neophyte in the modern school of enlightened Englishmen, we have already seen. The sentences which I shall now read, containing opinions of his on the subject of education in general and of Canadian education in particular, are taken from a speech delivered by him at the placing of the cope-stone on the turret of the Great Tower of the University Building, at Toronto, on the fourth of October, 1858. The report of the speech would, I think, have been the better for revision. The stenographer seems not to have caught the sense in every minute particular. One or two phraseological changes have accordingly been made. (For a full account, see the *Journal of Education*, xi., 163. It may be noted that the foundation-stone of the building had been laid exactly two years previously, without any public ceremony; and that one year later, namely in 1859, the professors were vigorously at work in their respective lecture-rooms).

It was in response to a toast at the lunch which followed the ceremony of October 4th, 1858, that Sir Edmund Head spoke. He said: "I shall long remember the kind manner in which the Vice-Chancellor has been pleased to speak of my services in connexion with the University. It is, however, my duty to tell him, and to tell you, gentlemen, that he has greatly overrated those services." (The Vice-Chancellor, Mr. Langton, in a preceding speech, had said that "from the smallest details to the most important matters, Sir Edmund had exhibited an interest in the building; and had it not been for him, he believed it would never have been built.") Sir Edmund then proceeded: "The good sense of the people of this country acknowledged the necessity for such a University and the advantages of the education to be afforded by it; and I have acted only in the discharge of my duty in doing what I have been enabled

to accomplish in promoting the progress and, I hope, in consolidating the foundation of this great institution. But although," he added, "the Vice-Chancellor has overrated my merits in connexion with the institution, he has not overrated my inclination to aid it. That inclination has ever been strong, and will ever continue strong." Then in exactly the strain which we can well conceive Walter de Merton himself adopting, when contemplating the condition of the rising generation of England, in 1264, Sir Edmund continued thus: "I have a thorough conviction that academical institutions, such as are calculated to afford the means of acquiring a superior education, are of the highest value, especially in new countries. They are of value in all countries. They are of value in old countries. But in new countries, which are beset with peculiar difficulties, these results are of great importance to the whole community. Such institutions are doubly important," he said, "where the rougher constituents of society are called upon at an early age to go into the wilderness, there to earn their daily subsistence—they are doubly important in every case where it is necessary that the young men of the country should go forth with those resources which may enable them to pass their leisure free from vice and in a manner befitting a Christian and a gentleman. You have to contend with circumstances which make it doubly difficult to apply a remedy for the softening down of that surface which is necessarily more or less roughened by contact with the world, because in new countries, such as this, men are called into active life at an earlier period than in old countries, and they have not therefore the means of receiving the fullest benefit of a University education.

"It is also clear," he then went on to say, "that however sound may be the basis of classical learning—that however much you may wish to refine those with whom your lot is cast—you must rear an enduring superstructure, or the mass of the community will not be able to receive at your hands the instruction which you desire to put before them.

"I consider," he next observed, "that the instruction inculcated in a University ought to extend a practical influence over a man's life, to enable him to go forth a better citizen and more able to earn his own bread in whatever walk of life he may be placed. In order to discharge these important duties successfully, all kinds of appliances are necessary. I accordingly felt a deep conviction that

amongst the means most essential to the future welfare of the University of Toronto, was that of a building alike worthy of the city in which the University is situated, and of the University itself. Such a building," he said, "was greatly needed, and I did not hesitate, as the Visitor, to sanction the outlay of the money necessary for the erection of the present structure. In so doing I felt convinced that the results would fully justify the step then taken."

He then enlarged on the benefits likely to result from the existence of such a structure as the one which had been erected. "Such a building," he said, "is important in many respects. There is a general disposition to depreciate that of which there is no outward, visible sign. The existence of a building like this, of an important character, commensurate with the growth of the University itself, tends to remove such an impression; and in the next place the appliances connected with the building are of first-rate importance, not only to the pupils of the University, but also to the community amongst whom the University is situated." He instanced the Library. "A few months," he said, "or at most a year or two, may pass, and the room in which we are now assembled will be filled with volumes of books; and in this room the citizens of Toronto, whether they are or are not members of the University, may, if they choose, seek recreation and information."

He then remarks on the influence likely to be exerted by the University Library. The ancient Library of Merton, it may be, passed at the moment through his thoughts. It is worthy of remembrance here, that not only was Merton College the prototype of English colleges, but Merton Library, the quaint old relic of the past which we have described, was the prototype of English college libraries—the first example of such an institution. It is interesting to hear the testimony of a former Fellow and Tutor of Walter de Merton's Society borne to the incalculable value of such a possession—borne on the occasion of the establishment of a similar Library some six hundred years after Walter de Merton's day, in Canada; in a region of the earth then undreamt of.

"The influence of such a library as this," Sir Edmund Head said, "is a most important matter. It is not only so with regard to what the young men take away, but it is so in its general humanizing spirit—in the feeling of respect for literature which grows by the possession of such an institution as this." He then observed on the Museum: "In regard also to another room which we have just left—

the Museum—I shall hope to see collected there such remains as may from time to time be found, and which would otherwise be scattered about and lost, of the aboriginal inhabitants of the country—remains," Sir Edmund added, "which my friend Professor Wilson is as well able to conserve and explain as any man I know. And again, in Natural History; a museum of that sort, constantly open for the reception of specimens, affords the certain prospect of the accumulation of that which is of the utmost importance in the history of science. And you have amongst you," the Governor took occasion to add, "men, such as Professors Hincks and Chapman, who are in every way qualified to occupy a high position in this branch of science.

"Another feature in connection with this building," Sir Edmund Head then said, "which I look upon as of great importance, is that of providing accommodation within the walls of the College for some portion of the students. [An especial feature and peculiarity in the innovations of Walter de Merton, in 1264, was residence within the College walls. Previously, scholars attending the lectures of the jangling doctors were lodged very promiscuously in the streets and lanes of a confined mediæval walled town.] This," Sir Edmund observed, "is undoubtedly one of the most powerful means of forming the character, and maintaining, through the influence of College discipline, that decorum and that sense of propriety with which you would wish to see the pupils leave the walls of the institution."

He then goes on to remark on the architecture of the building, and to interpret, in an interesting manner, its significance.

"I do not know," he says, "that the time would allow me to go more into detail on the points connected with the building as bearing upon the success of the University itself. I cannot, however, sit down without adding a few words in reference to the character of the building. I congratulate the architect," he said, "for having dealt with the structure in the successful manner he has done. I congratulate him, inasmuch as I believe he was the first to introduce this style of building into the American continent. So far as my knowledge extends, I am not aware of any other instance of the Norman or Romanesque style of architecture on the continent. There may be such instances, but I know of none.

"I believe that style," the speaker then went on to say, "is capable of the most useful results. To my own mind it suggests a variety

of analogies, some of them bearing particularly on the nature of the duties of the members of the University here assembled. In the first place, I never see a building of this style of architecture—whether it be ecclesiastical or civil—but I regard it as a type of modern civilization. It is the adaptation to modern purposes of forms which originated long ago—it is the adaptation of Roman architecture to modern civilization. Where did you get these forms? Where did you get the processes which give birth to municipalities — those municipalities which, under different names, are spreading over the continent of America, carrying the principles of local self-government with them? They are from Rome, from whence comes this Romanesque architecture; they are the adaptation of forms derived from Rome to the wants of modern society. Many things in modern Europe are," he added, "precisely analogous to the style of the building in which we are this evening assembled. I will say, moreover," he continued, "that the style of the architecture of this building suggests some reflections upon the duties of the University itself; for it is the business of the University to give a sound classical education to the youth of our country, and to impart to them that instruction and information which are essential to the discharge of their duties as citizens, both in public and private life, according to the wants and usages of modern society. I say, sir, we may take the building in which we are assembled as the type of the duties standing before the University to discharge."

It should be added, that previous to the ascent of the great gateway tower, for the purpose of placing the cope-stone on the apex of its turret, Sir Edmund Head, in the true Mertonian spirit of the olden time, had addressed the assemblage present with the words: "Before proceeding to the work, let us join in supplicating the Divine blessing;" when an appropriate prayer was said by the President of the University, the Rev. Dr. McCaul.

Thus have I endeavoured to occupy your attention, for a short space, with three distinguished Governors of Canada, who were sometime members or fellows of Merton College in Oxford, and who, in relation to the higher education of the Canadian people, shewed themselves, by their words and deeds, worthy descendants of the enlightened Walter de Merton, of the reign of Henry III. Canadians, when they visit Oxford, remembering these things, will, I am sure, look with an added interest on Merton College, for the sake of

men who once had their habitation temporarily within its venerable walls, but who now have become inseparably associated with the history of Canada, from having been the means of transferring hither traditions and ideas and solid institutions which, by an imperishable link, will in all future time unite Canadian scholars with Oxford—with the Oxford of to-day, and strangely likewise with the Oxford of 1264.

We may possibly have had other rulers in Canada who were once members of Merton, or members of some other of the twenty-five colleges or halls of Oxford; but we are not aware of any who have so fully delivered themselves, as the three spoken of, on the subject of University education as adapted to Canada.

Sir Charles Bagot was a member of Christ Church in the University of Oxford; and his was the hand that actually laid the foundation-stone of King's College, out of which University College and the University of Toronto have grown. But we doubt whether his views on University education were quite of a character adapted to the condition of this particular country. He certainly in no way qualified his approbation of the charter of the Canadian National University as it read in 1842. Perhaps it was not his business to do so. He said: "I have ever considered the two Universities of Oxford and Cambridge as the breasts of the mother-country. From them has been derived," he rather sweepingly observes, "all the comforts of pure and social religion—all that is useful and beneficial in science—all that is graceful and ornamental in literature. These same blessings," he then adds, "unless I greatly deceive myself, we have, under Providence, this day transplanted into these mighty regions. There may they continue from generation to generation! There may they serve to instruct, enlighten and adorn your children's children through ages yet unborn, as they have for many ages past the children of our parent state."

And on the plate inserted in the foundation-stone it was set forth in admirable Latin, that "It was the desire of our illustrious Chancellor (*i. e.*, Sir Charles Bagot) that the youth of Canada should, within their own borders, enjoy without delay, and transmit to posterity, the benefits of a religious, learned, and scientific education, framed in exact imitation of the unrivalled models of the British Universities." (Voluit vir egregius ut Canadæ statim esset ubi Juventus, Religionis, Doctrinæ, Artiumque Bonarum Studiis et

Disciplina, præstantissimum ad exemplar Britannicarum Universitatum imitando expressis, ipsa jam frueretur, eademque posteris fruenda traderet.)

The Charter, indeed, of King's College, in 1842, was held and declared by its friends to be an unusually liberal one, considering the time in which it was granted, and the source whence it emanated. On the day of the opening of the Institution, it was stated by the President, Dr. Strachan, that "the Charter of the University of King's College was not hastily settled. It was nearly a whole year under serious deliberation. It was repeatedly referred to the Archbishop of Canterbury, Dr. Manners, who doubted the propriety of assenting to an instrument so free and comprehensive in its provisions. It was considered," the President proceeded to say, "not only the most open Charter for a University that had ever been granted, but the most liberal that could be framed on constitutional principles; and His Majesty's Government declared that in passing it they had gone to the utmost limit of concession." The unprecedented liberality of the Royal Charter consisted in the declaration: "No religious test or qualification shall be required of, or appointed for, any persons admitted or matriculated as scholars within our said College, or of persons admitted to any degree in any Art or Faculty therein, except Divinity."

That it should have been thought, however, that this concession would suffice to render all the other provisions of the Charter acceptable to a community like that of Canada, fills the mind with amazement. The President was at all times to be the Archdeacon of York *ex-officio*. The Council was to consist of the President and seven Professors, who were also, for all time, to be members of the Established United Church of England and Ireland.

I am not now saying anything to the contrary but that all these arrangements would have resulted in a system very efficient; I am simply expressing astonishment, that with a perfect knowledge of the composition of the Canadian people, recruited annually from complex communities like those of the British Islands, it should have been for a moment supposed that in all future time such arrangements as these could be maintained in an institution held to be provincial and quasi-national.

The cautious terms in which the House of Assembly of Upper Canada returned their thanks to the Governor, Sir Peregrine Maitland, when he announced to them the Royal boon of a University

Charter, are very noteworthy. They professed great gratitude to the King, provided "the principles upon which it (the contemplated institution) had been founded should, upon enquiry, prove to be conducive to the advancement of true learning and piety, and friendly to the civil and religious liberty of the people." They plainly had their doubts. From rumours afloat they feared some peril latent in the Royal gift; and, rightly or wrongly, they determined that the youth of the country should not be forced by any power into a training school controlled by any class exclusively.

This, in principle, was the protest of Walter de Merton when, in 1264, he innovated on the prevailing system of education at Oxford, and delivered his little band of scholars out of the hands of the warring Friars. The framers of the Charter of the Canadian King's College of 1842, chose only to contemplate Society as it was, or rather as it had been in years bygone, when in a condition of greater perfection, as they would perhaps have contended.

The plain representatives of the people of Upper Canada, in the House of Assembly, on the other hand, by a shrewd instinct, kept their regards fixed more on the present, more on things as they were among themselves. They were, they knew, a mingled multitude drawn from numerous sources, all accustomed to liberty and notions of equality, desirous, however, of dwelling together in peace; and such a people they were likely to be in the years to come, increasingly. Having, then, the power, they determined by law to abate in time pretensions that must prove finally untenable in whatever quarter they might make their appearance.

The *Regula Mertonensis*, the Merton rule—adopted in all Colleges more or less, and so speedily revolutionizing the University system, in Great Britain at least—was a sign that, in the history of Great Britain, a new era was beginning, with peculiar and increased requirements. Ever since 1264 the spirit of Walter de Merton has been marching on; and he must be obtuse indeed, who does not see that the expansions, the modifications, the changes generally, which are at the present time being advocated, and indeed being gradually adopted in regard to education in all its branches, are, whether we like them or not, the requirements of a new age—requirements of the generations of men who are to succeed us, and who are destined, as we trust and believe, to enjoy—under the superintendence of a benign Providence—blessings of mind, body, and estate, greater even than those which have fallen to the lot of ourselves or our forefathers.

CONTRIBUTIONS TO A FAUNA CANADENSIS;

BEING AN ACCOUNT OF THE

ANIMALS DREDGED IN LAKE ONTARIO IN 1872.

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The present paper is intended as a supplement to the "Preliminary Report on Dredgings in Lake Ontario," which I have already had the honour of submitting to the Government of the Province of Ontario. In that paper I gave a brief account of the results which were obtained in the dredgings which I carried out in the summer of 1872 under the auspices of the Ontario Government. I now purpose to describe more fully the animals obtained in these dredgings; but, before commencing the actual description of these, it may be as well to repeat the description given in the Report already referred to (*Annals and Magazine of Natural History, October, 1872,*) of the nature of the bottom of the lake at various depths.

The dredgings were all carried on in the later part of June and the early part of July, and were made partly from the yacht "Ina" and partly from the steamer "Bouquet." They were entirely carried on by hand, and the dredges and rope were such as are ordinarily employed in deep-sea dredgings. In dredging in deep water, however, a bag of embroidery canvas was attached outside the ordinary net—an addition rendered necessary by the extremely fine nature of the mud at great depths. Even with this precaution, the dredge not unfrequently came up empty from great depths, all the finer portions of its contents having been washed out. In deep water, also, a fifty-six pound weight was attached to the rope about twelve feet above the dredge; and the same was necessary in shallow water, where the weeds were very thick, in order to secure that the dredge should reach the actual bottom.

The dredgings were all carried on within a radius of ten miles from Toronto; and the following will show the general nature of the bottom

at various depths and the chief localities in which the dredgings were prosecuted.

In Toronto Bay itself numerous hauls were made, both from the yacht and the steamer, and the bottom proved very varied, though the depth is almost constantly from two to three fathoms. The greater portion of the Bay, comprising the central portion of its area, appears to consist uniformly of a tenacious, bluish-gray, exceedingly fine, clayey mud, the temperature of which is very low. All the shells in this clay are dead, but it contains numerous small Annelides of the genus *Sœnuris*, along with many larvæ of a Dipterous insect allied to *Chironomus* or *Corethra*, the latter being very conspicuous from their brilliant red colour. The muddy bottom appears to be wholly destitute of weeds, and does not seem to encroach upon depths of less than two fathoms.

Towards the edges of the Bay, where the depth diminishes to one and a half fathom or less, the bottom consists of sand, covered over considerable areas with a dense growth of weeds of different kinds. The chief varieties of bottom in this shallow zone are the following:— 1. Pure siliceous sand with dead shells, almost destitute of life. 2. Sandy mud with a dense growth of Charas, containing numerous *Gammari*, small leeches, larvæ of *Chironomus* and Ephemerids, with shells of *Unio*, *Cyclas*, *Pisidium*, *Paludina*, *Planorbis*, *Physa*, *Melania*, and *Valvata*. 3. Sandy mud, sometimes with peaty layers, supporting a luxuriant vegetation of *Anacharis Canadensis* and *Charæ*. The life in these portions of the Bay consisted of much the same animals as the preceding, except that the *Gammari* were absent, unless in the occasional patches of Charas brought up by the dredge. In some places, in from one to one and a half fathom of water, the sand was crowded with *Uniones*, the dredge coming up completely packed with living and dead shells. This was expecially the case at several points under the lee of the "Island," a long, flat, insulated strip of land, which forms the southern boundary of the Bay, running parallel with the shore on which Toronto is built, at a distance of about a mile and three quarters from it.

Another series of dredgings was carried out from a point in the open lake about eight miles to the south of Toronto, on a line extending to the Toronto Rolling-mills, the depth varying from forty fathoms at its northern extremity. The deep dredgings along this line were only partially successful, the dredge bringing up nothing but good-sized

pebbles, and all the finer materials having been washed out before it reached the surface. In about fifteen fathoms the bottom was found to consist of a tenacious blue clay, distinctly laminated, and containing numerous broken-up stems of plants, along with small pebbles. No traces of life could be detected beyond a few minute Annelides of the genus *Sænuris*. Another haul in ten fathoms brought up the dredge full of sand and pebbles with no traces of life; and another in eight fathoms showed a bottom of clean sand, with dead shells of *Cyclas* and *Pisidium*, but devoid of all vestiges of animal or vegetable life.

Another series of dredgings was taken along a line extending in a south-east direction from Gibraltar Point to a point about five miles out in the lake, the depths varying from eight to fifteen fathoms. In this case the bottom was found to consist uniformly of an excessively fine, bluish, argillaceous mud, with numerous patches of a small bushy Alga (a species of *Cladophora*). The mud contained very numerous minute Annelides of the genus *Sænuris*, along with dead shells of *Cyclas*, *Pisidium* and *Planorbis;* and the bunches of *Cladophora* yielded a large number of little Ostracode Crustaceans and a few beautiful little Amphipods, both of which are at present undetermined.

Another series of dredgings was carried out still further to the southwest of the ground examined in the series just mentioned, at a distance of about eight miles from the shore. The depth here varied from thirty to forty or fifty fathoms; and the bottom was found to consist everywhere of a fine grayish mud, sometimes highly argillaceous, sometimes more or less arenaceous, with many small pebbles disseminated through it, and containing a few dead shells of *Planorbis* and *Pisidium*, with much broken down vegetable *débris*. The *Cladophora* was absent, and no traces of vegetable life were detected. Every haul of the dredge brought up numerous specimens of a beautiful flesh-coloured Amphipod and a few minute Oligochætous Annelides; but no other traces of life were obtained. The Amphipods were referable to *Pontoporeia*, and are apparently undistinguishable from *Pontoporeia affinis* of the great lakes of Sweden.

Another series of dredgings was taken in Humber Bay, about four miles to the west of Toronto. Here the bottom, except close to the shore, consisted of a tenacious bluish-gray clayey mud, sometimes with reddish patches in it. Vegetable life was very scanty; and

animal life consisted entirely of many minute Annelides. Close inshore, the bottom consisted of shingle derived from the shales and grits of the Hudson River group.

Lastly, an examination was made, partly with the dredge and partly by means of a hand-net, of the shallow water in the immediate neighborhood of the "Island," and of the extensive ponds which communicate with the lake. The bottom here consisted, for the most part, of a black mud, composed almost entirely of decayed vegetable matter, and supporting a luxuriant growth of *Vallisneria*, *Pontederia*, *Chara*, *Anacharis*, *Nymphæa* and *Nuphar*. Animal life was, naturally, extremely abundant, comprising numerous examples of *Limnæa*, *Physa*, *Planorbis*, *Paludina*, *Cyclas*, *Pisidium* and *Anodon*, along with two species of *Gammarus* and many small Ostracode Crustaceans, a few small leeches (*Clepsine*), very many large scarlet water-mites (*Limnochares*), numerous aquatic insects (*Nepa*, *Gyrinus*, *Dytiscus*, and larvæ of *Chironomus*, *Libellula*, &c.), and a large number of young fishes (*Pimelodus*, *Perca*, &c.). Numerous Terrapins were also observed, and a single specimen of *Menobranchus*, but the latter unfortunately was not secured.

In the following are given the chief characters of the animals obtained in these dredgings. The microscopic species have, however, been, in the meanwhile, omitted from the list. Owing, also, to the impossibility of obtaining here the necessary works of reference, it has not been found feasible in all cases to determine the species, or in some cases even the genus, of some of the specimens.

ANNELIDA.

Of all the forms obtained in the dredgings none are of greater interest than the Annelides. Both the *Hirudinea* and *Oligochæta* are well represented, some of the former exhibiting points of special interest. Some of the Oligochætous Annelides, also, have an extremely wide range, extending to nearly the greatest depths examined, and being rarely absent when the bottom is of a muddy nature. They did not appear to exist, however, in depths beyond twenty fathoms, though small Crustaceans were found at far greater depths than this.

The total number of Annelides which have been made out is seven, three species of *Naididæ* and four species of Leeches. Of the former one species is new, and of the latter no less than three species appear

to be hitherto undescribed. All the Leeches were found in comparatively shallow water, none being detected in depths greater than three fathoms. They all belong also to small forms of *Clepsine* and *Nephelis;* but an examination of the shallower parts of the lake in early spring would doubtless bring to light some forms of greater size.

1. *Clepsine patelliformis*, Nich.

Body much depressed, convex above, flattened or slightly concave below, the width nearly as great as the length when the animal is contracted. The adult is ovate in shape, the anterior extremity somewhat acuminate and narrower than the posterior. The length varies from one-fifth to one-half of an inch; the greatest breadth being about one-fifth of an inch. On the under surface of the head is placed the mouth, in the form of an oval aperture about one-twentieth of an inch in breadth.

The colour is sometimes dark greenish-brown, sometimes nearly black, sometimes light-brown; always covered with innumerable minute black points and numerous yellow spots, the latter being especially abundant towards the margins. The colour probably varies with that of the object to which the leech adheres; but this point was not specially observed. In all the lighter-coloured specimens there are two very distinct dorsal black lines, somewhat interrupted, and placed one on each side of the median line of the back (Fig. 1). In the darkest specimens these lines are hardly distinguishable. In all

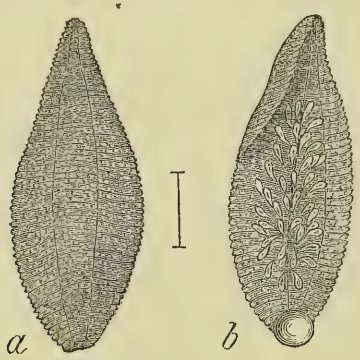

FIG. 1. *Clepsine patelliformis*, Nich.—*a*. Dorsal view of the adult, considerably enlarged. *b*. Ventral surface of the adult, showing the posterior sucker and the parasitic young.

specimens, however, the ventral surface is lighter than the dorsal, and exhibits two distinct black lines, also somewhat interrupted, and also placed one on each side of the middle line of the body. Both the dorsal and ventral lines are slightly curved, and approach one another toward the two ends of the body. Just at the commencement of the dorsal lines, on the top of the head, are situated six minute black ocelli, arranged in three closely approximated pairs one behind the other, the two posterior pairs being the largest and most conspicuous (Fig. 2, *b*).

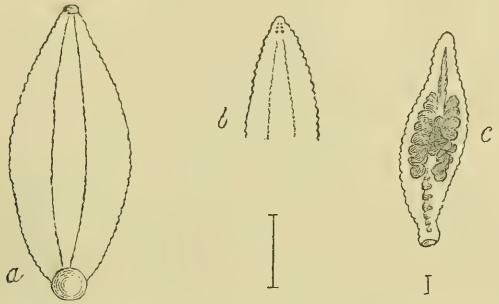

FIG. 2.—*Clepsine patelliformis*, Nich.—*a*. Outline of adult viewed from below, showing the mouth, ventral lines, and acetabulum. *b*. Anterior extremity, enlarged to show the ocelli. *c*. Young, much enlarged, to show the sacculated stomach and pedunculate sucker. The straight lines indicate the real sizes of the adult and young.

The habits of this little leech are very remarkable. The adult leech usually places itself with its ventral surface closely appressed to some foreign body, such as a stone or a dead shell, to which it adheres firmly, like a limpet or small Chiton. It is from this habit that the specific name of *patelliformis* has been chosen. When forcibly detached or irritated, it rolls up like a hedgehog or like the Myriapods of the genus *Glomeris*. The object served by these peculiar habits becomes obvious when it is seen that almost every individual carries attached to the ventral surface of the body a large number (from twenty to thirty) of young leeches (Fig. 1, *b*).

The young are attached to the ventral surface of the parent posteriorly in a close cluster, which is surrounded on all sides by a vacant space. Each adheres to the adult by means of the posterior sucker, which is very distinctly marked and constricted off from the rest of the body (Fig. 2, *c*.) The length of the young varies from about $\frac{1}{23}$ to $\frac{1}{12}$ of an inch; the color being light yellow or reddish, and the

body being semi-transparent. The gullet is distinct, and leads into a much sacculated stomach, which is very conspicuous from its dark color (Fig. 2, *c*). The annulations of the body are very distinct, and the integument is finely tuberculated or papillose.

This extraordinary habit of carrying the young has been noticed by Prof. Verrill, in another species of *Clepsine (Amer. Journ. Science and Arts, III., Feb., 1872);* but I am not aware that attention has otherwise been drawn to it.

In my "Preliminary Report," (Annals of Natural History, Oct., 1872,) I referred this species to the genus *Nephelis*, but it is more satisfactorily placed under *Clepsine*.

Hab.—Common in from two to three fathoms, adhering to stones or to the shells of *Unio crassidens*.

2. *Clepsine sub-modesta*, Nich.

Length in contraction, one-fifth of an inch; in extension, one-quarter to one-half of an inch. Body a long oval, attenuated in front when extended, convex above, concave or flattened below. Back smooth. Two minute black ocelli carried upon the top of the head. The margins of the body exhibiting broad transparent papillose margins, the rest of the body being of a light, dirty, greenish-brown colour. (The preserved specimens are nearly white.) Behind the head, in the middle line of the back, is placed an auditory vesicle or "cervical gland," in the form of a rounded, slightly prominent, chestnut brown spot. Sometimes there are two of these, the smaller being placed a little behind the other (Fig. 3).

The habits of this species are very similar to those of *C. patelliformis*. It carries its young attached to the posterior portion of the ventral surface in a bunch or cluster, and it rolls up into a ball when irritated. The attached young are about a line in length, of a pale whitish-brown colour, semi-transparent, and showing the brown line of the alimentary canal.

FIG. 3.—*Clepsine sub-modesta*, Nich.—*a*. Outline of adult viewed from above enlarged. *b*. Side view of adult, enlarged, showing the attached young.

This species is nearly allied to *Clepsine modesta*, Verrill *(Amer. Journ. Science and Arts, III.. Feb., 1872);* but it is distinguished

by its much smaller size and paler colour, as well as by the broader and less attenuated form of its anterior extremity. On the other hand, *C. modesta* is described as reaching the length of an inch and a half in extension, being "pale purplish brown or purplish flesh-colour, with minute specks of brown, and very small round spots of a dull yellow, and often of a light green." The anterior portion of the body also is very slender and attenuated. Much stress can not, perhaps, be laid upon the differences in color, but the other distinctions appear to have a specific value.

Hab.—Common in from one to three fathoms, mostly adhering to aquatic plants, but also found on pebbles or dead shells.

3. *Nephelis lateralis*, Say, sp. (?)

The original specimens on which this species was founded were originally obtained by Say from the waters between Rainy Lake and Lake Superior, and were named by him *Hirudo lateralis (Long's Second Expedition, Vol. II., p. 267, 1824.)* They were subsequently referred to the genus *Nephelis*, by Prof. Verrill *(Amer. Journ. Science and Arts, II., p. 451).* Say described the species as being of a livid colour, with a rufous line along each side and a few very remote minute black points, the ocelli being six in number, and placed in a regularly curved line.

The specimen which was obtained in Lake Ontario, and which I have doubtfully regarded as a young example of this species, was about an inch in length when at rest. The colour in life was a liver-brown, not exhibiting any lateral lines. In the specimen preserved in spirits the ocelli can not be made out. Our example, however, agrees with those described by Verrill in being slender and somewhat rounded in front, with rounded lateral margins, and having the posterior portion of the body somewhat depressed.

Hab.—A single specimen was dredged in Toronto Bay in a depth of three fathoms.

4. *Nephelis vermiformis*, Nich.

A small worm-like leech of a red colour during life. Length about half an inch in contraction and one inch in extension; the greatest width about one line. The body slightly narrower anteriorly than posteriorly. Acetabulum oval, oblique, as wide as the body.

Mouth small and rounded, the lips with several folds. In the specimens preserved in spirits no ocelli could be made out. Though

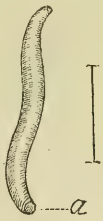

FIG. 4.—*Nephelis vermiformis*, Nich. Enlarged.—*a*. Acetabulum.

certainly new to America, it is possible that this form is only a variety of some other species, but the impossibility of obtaining access to the necessary works of reference renders me unable to speak positively on this point.

The habits of *Nephelis vermiformis* are very different from those of the two species of *Clepsine* already described. Instead of remaining quiescent, attached to some foreign body, it is exceedingly active in its movements, swimming gracefully through the water by means of a serpentine bending of the body.

Hab.—Rare in three fathoms, Toronto Bay.

5. *Sœnuris Canadensis*, Nich.

A very slender worm, averaging about an inch in length, but sometimes a little longer or shorter. The body tapering and attenuated posteriorly; the width behind the head being about one twenty-fifth of an inch. Intestine moniliform; anus terminal, with three lobes. Setæ in four fascicles on each segment; each fascicle of three or four setæ; the setæ forked and hooked at their tips. Colour during life red.

Owing to some defect in the spirit in which these specimens were originally put up, their state of preservation was so bad as to render it impossible to make out many important points in their organisation. I have, however, no doubt as to the specific distinctness of this form. It is most nearly allied to the *Sœnuris limicola* of Verrill, obtained in Lake Superior, but it is much larger, and the setæ are hooked and bifurcate at their tips, instead of being simply curved and acute.

Hab.—Extraordinarily abundant at all depths in Lake Ontario, wherever the bottom consisted of a fine argillaceous mud. Beyond

twenty fathoms they became much diminished in numbers, and they did not present themselves at all wherever the bottom was of a sandy nature.

6. *Sænuris*, sp.

Worm more robust, shorter, and broader than the preceding. Length from one half to three quarters of an inch; width behind the head about one twentieth of an inch. Body slightly attenuated posteriorly. Setæ in four fascicles on each segment; each fascicle of six or eight setæ arranged in a fan; the setæ hooked and forked at their tips. Cephalic lobe broad and sub-conical. Intestine not markedly moniliform.

I entertain little doubt but that this form is a new species; but from the cause already mentioned its state of preservation was so bad as to preclude any minute examination of its peculiarities. I have, therefore, not ventured to assign to it a specific name.

Hab.—Not uncommon on the same bottom and at the same depths as the preceding.

7. *Lumbriculus*, sp.

A fine Oligochætous Annelide, of a red colour, and about two inches in length. Body distinctly annulated. Head conical. Four rows of straight spine-like setæ, arranged in pairs.

This form is very possibly new, but the absence of proper works of reference renders it unsafe to give it a specific title. It is somewhat related to *Lumbricus lacustris*, Verrill, from Lake Superior, but the setæ are straight and not curved.

Hab.—A single individual was dredged in three fathoms in Toronto Bay, on a sandy bottom.

CRUSTACEA.

The Crustaceans which were obtained, though few in number and of small size, present some points of special interest. Owing, however, to want of proper works of reference, I am compelled to leave the *Crustacea* and *Arachnida* at present undescribed.

The most interesting form of the *Crustacea* is a little Amphipod which is probably identical with *Pontoporeia affinis*, Lindström. The importance attaching to this form arises from the fact that it belongs to a genus which is otherwise marine, and that it is found in collections of fresh water as far removed from one another as Lake Superior on the one hand, and Lakes Wetter and Wener in Sweden on the other hand. In these last mentioned localities it is associated with Crusta-

ceans belonging to other marine genera, such as *Mysis*, *Idotea*, and *Gammaracanthus;* and in Lakes Superior and Michigan it is associated likewise with *Mysis*. Both in Scandinavia and in the Upper Lakes of North America the species of *Mysis* is the same, viz., *M. relicta*, Lovén—a species which is regarded by its describer as being identical with the *Mysis oculata*, Fabricius, of both sides of the Atlantic. Upon these facts, Lovén founded the theory that the Scandinavian lakes had formerly been part of the sea, from which they had been cut off by geological changes resulting in the elevation of the Scandinavian peninsula. He believed that the *Mysis* and other species of Crustaceans belonging to marine genera had originally inhabited salt water, but that they had been able to survive and accommodate themselves to the change by which the Swedish lakes were gradually and slowly converted into fresh water, whilst other less plastic forms of marine life had died out. Lastly, he believed that the differences between the Crustaceans of the lakes and the allied species of the neighbouring ocean were due to the modifications which the former had undergone in adapting themselves to live in fresh water.

Without entering into the merits of Lovén's theory, it is extremely interesting to find that Lakes Superior and Michigan have yielded at any rate two of the Crustaceans of the Scandinavian Lakes, namely, *Pontoporeia affinis* and *Mysis relicta*. The last mentioned species, curiously enough, does not appear to exist in Lake Ontario, though plentiful in Lake Superior; probably because the conditions present in the latter lake are somehow more suitable for it. The other species, however, viz., *Pontoporeia affinis*, if rightly determined, abounds in the deeper parts of Lake Ontario.

As before remarked, the Crustacea must be left for the present undescribed; but the following list indicates the forms which were discovered in Lake Ontario, and the habitat of each.

8. *Gammarus*, sp.

A small fresh-water shrimp, varying in length from one-fifth to one quarter of an inch, and of a greenish-brown colour during life, with a dark green intestinal tract. The antennæ and antennules are about half the length of the body, and nearly equal.

Hab.—Numerous examples of this pretty little species occurred amongst *Charæ* and other aquatic plants in depths of from one to three fathoms.

9. *Gammarus*, sp.

A form much smaller than the preceding, of common occurrence in shallow water at the ponds of the "Island."

10. *Crangonyx* (*?*), sp.

A small Amphipod, which may perhaps belong to this genus.

Hab.—Not uncommon in from ten to fifteen fathoms, amongst bunches of *Cladophora* upon a muddy bottom.

11. *Cypris* (*?*) sp.

A small Ostracode Crustacean, probably belonging to this genus, which occurred plentifully, along with the preceding, amongst *Cladophora* upon a muddy bottom and at a depth of from ten to fifteen fathoms.

12. *Pontoporeia affinis*, Lindström.

Small Amphipods, varying in length from one-tenth to one quarter of an inch, and of a uniform pale flesh colour. They appear to be referable to the Swedish species.

Hab.—Very plentiful on a bottom of sandy mud in depths of from thirty to forty fathoms. None were found in depths less than this, though they occur plentifully in Lake Superior in all dredgings from the shallowest to the deepest.

ARACHNIDA.

13. *Limnochares*, sp.

A fine species of this genus of Water Mites was extremely abundant in shallow water and in the ponds at the "Island."

14. *Hydrachna*, sp.

A small Water-Mite occurred abundantly in Toronto Bay in from one to two fathoms.

INSECTA.

15. *Chironomus* or *Corethra*, sp.

The larvæ of a species of Dipteron belonging to one or other of the above-mentioned nearly allied genera occurred abundantly in all the dredgings in which a muddy bottom was found in depths of from two to twenty fathoms, but more abundantly in the smaller depths. The colour varied in different examples from deep blood-red to pink or greenish; and their semi-transparency rendered them very beautiful objects under the microscope.

16. *Ephemeridæ.*

Larvæ of two or three species of Ephemerids were found rarely in shallow water to a depth of two fathoms.

MOLLUSCA.

The *Mollusca*, though very abundant individually, and represented by no less than twenty-one species, present no points of special interest, being all more or less familiar fresh-water forms. It is noticeable however, that their bathymetrical range is not so wide as might have been anticipated from previous researches. With one exception, all the examples dredged from depths greater than perhaps four or five fathoms were dead, and almost all the living individuals were obtained from depths less than three fathoms. *Valvata tricarinata*, alone, was found in a living state in depths extending up to eight fathoms.

17. *Melania Virginica*, Say.

Shell tapering, elongated, with seven whorls above the body-whorl, the whorls slightly rounded, and crossed by longitudinal curved striae. Aperture sub-ovate, pointed above, its columellar margin slightly thickened and callous. Colour reddish brown or olive, without bands.

Length from one quarter of an inch to one inch; length of aperture in large specimens nearly four lines.

I at first thought this species might be only a variety of *M. depygis*, Say; but it appears on more careful examination to belong to *M. Virginica*.

Hab.—Common in from two to three fathoms in Toronto Bay.

18. *Planorbis trivolvis*, Say.

Shell most readily recognised by the fact that it is carinated on both sides, but most markedly on the right side, on which the volutions of the shell form a depressed spire. The lip is thickened internally, and is angulated opposite each carina. The whorls are marked with curved transverse lines, and the general colour of the shell is pale olive.

Hab.—Very common in shallow water, but not extending beyond three fathoms.

19. *Planorbis*, sp.

A form allied to the preceding, but which I have been unable to identify. It is distinguished from *P. trivolvis*, Say, by its much

more rounded and ventricose form, by having the spire on one side perfectly flat and exhibiting all the whorls; whilst the other side is depressed but widely open. The flat side of the shell is carinated, and the aperture angulated opposite to the carina. The whorls are crossed by numerous fine curved lines. Colour pale brown or olive.

Hab.—Rare in Toronto Bay in one to two fathoms.

20. *Planorbis parvus*, Say.

This little species is easily made out by its small, thin, discoidal shell, both sides of which exhibit all the volutions. The upper side is nearly flat, though concave centrally, and the umbilicus is shallow and wide. The aperture is oblique and rounded, and the lip is acute and thin. Colour yellowish or pale brown. The larger specimens attain a diameter of nearly two lines, the smaller about one line.

Hab.—Not uncommon in Toronto Bay in from one to three fathoms.

21. *Valvata tricarinata*, Say.

Shell small, thin, slightly elevated, with a large and deep umbilicus exposing the whorls. Whorls three, strongly keeled with two carinæ, and marked with transverse curved lines. Aperture round, complete; lip thin. Suture deeply impressed. Colour pale greenish-brown or brownish white. Full-grown specimens about one-tenth of an inch in height by nearly two lines in diameter.

Hab.—Abundant, crawling over aquatic plants, in from one to eight fathoms. Most abundant in Toronto Bay.

22. *Valvata sincera*, Say.

Shell small, thin, slightly elevated, with a large and deep umbilicus exposing all the volutions. Whorls three or nearly four, rounded and not carinated, marked across with very numerous and regular curved striæ. Aperture round, complete, the lip thin and acute. Colour light brownish, or brownish-green. Size variable, large specimens being almost a line in height with a diameter of nearly two lines.

This species is very closely allied to *Valvata tricarinata*, Say, from which it differs almost solely in the fact that the whorls are rounded instead of being keeled. This peculiarity gives a very distinct *facies* to the two shells, and there is not the smallest difficulty in picking out well-marked examples of each. A number of intermediate examples, however, occur, in which there are more or less faintly or

strongly pronounced carinæ on the whorls. It is thus rendered a matter of opinion whether the two species should not properly be thrown into one.

Hab.—Common, adhering to water plants, in depths of from one to five fathoms.

23. *Paludina decisa*, Say.

Shell ovate, with an elongate spire. Whorls four or five, rounded, with faintly-marked or obsolete transverse striæ. Aperture sub-ovate, angulated posteriorly; lip thin. Operculum horny, concentrically striated.

Colour variable, generally olive-green, often tinged orange-brown or russet; interior generally of a purplish tint.

Length of large specimens one inch, by seven-tenths of an inch in diameter; of small specimens three-tenths of an inch by one-fifth of an inch in diameter.

Hab.—In a living state and in all stages of growth, in from two to three fathoms, on a sandy bottom.

24. *Amnicola porata*, Say, sp.

Shell minute, obtusely conical, of four rounded whorls, which are separated by a well-marked suture, and have a smooth surface. Aperture somewhat ovate, and slightly angulated posteriorly, the posterior half of the inner lip confluent with the columella. Umbilicus small but well-marked. Colour olive-green. Dimensions of adult shell nearly two-tenths of an inch in length by a little more than one-tenth of an inch in diameter.

Our specimens differ in some trivial respects from typical examples of *Amnicola (Paludina) porata*, Say; but these differences do not appear to have more than a varietal value.

Hab.—Very abundant, crawling over the stems of *Chara* and *Anacharis*, in from one to three fathoms.

25. *Limnæa jugularis*, Say.

Shell of large size, thin, nearly translucent, with ventricose whorls. Whorls six in number, rounded. Spire regularly tapering, a little shorter than the aperture. Aperture large, the inner lip nearly straight, with a deep, oblique columellar fold. Outer lip somewhat expanded. No umbilicus. Colour olive, light brown, or ferruginous. Length of largest specimen observed, one inch and a half, with a diameter of seven-tenths of an inch.

Hab.—Abundant in shallow water at the "Island."

26. *Limnæa*, sp.

A small undetermined species allied to *Limnæa columella*, Say.

Hab.—Rare in from one to two fathoms in Toronto Bay.

27. *Physa heterostropha*, Say.

Shell sinistral, with a ventricose and capacious body-whorl. Spire short, of three whorls, acute. Suture distinct. Aperture about three-fourths as long as the shell, somewhat oval, acute posteriorly. The outer lip thin; the inner lip thickened in front.

Colour dark brown, semi-transparent. Size variable; length of large specimens from one half to seven-tenths of an inch.

Hab.—Common in shallow water at the "Island."

28. *Physa*, sp.

A small fragile, horn-coloured form, much resembling the preceding in most respects, and, perhaps, its young.

Hab.—Rare in from one to three fathoms.

29. *Cyclas similis*, Say.

Shell transversely oval, with strongly convex, nearly equilateral valves. Anterior and posterior margins nearly equally rounded, the anterior slightly the most so. Base nearly straight. Umbones nearly central, directed slightly forward, obtuse. Surface with numerous, regular, concentric striæ. Cardinal teeth, two in number, minute, oblique. Lateral teeth elongated, oblique, bifid on one side. Colour paler or darker brown, sometimes with a greenish tinge; internally bluish white.

Transverse diameter from one half to seven-tenths of an inch; vertical diameter from three to five-tenths of an inch.

Hab.—Common in from one to three fathoms.

30. *Pisidium abditum*, Haldemand.

Shell minute, ovate, concentrically striated, inequilateral. Umbones directed anteriorly. Anterior margin obtusely rounded; posterior margin somewhat pointed; base slightly rounded. Shell ventricose; beaks in contact. Colour yellowish-brown or flesh-coloured. Transverse diameter one-tenth of an inch; vertical diameter the same, or slightly less.

Hab.—Common in from one to five fathoms.

31. *Unio crassidens*, Lamarck.

Common, both in the living and the dead state, in from one to three fathoms in Toronto Bay.

32. *Unio ochraceus*, Say.

Common in Toronto Bay, in from one to three fathoms.

33. *Unio complanatus*, Solander.

Common in Toronto Bay.

34. *Unio*, sp.

A large, ventricose form, occurring rarely in Toronto Bay, in from one to three fathoms.

35. *Unio*, sp.

A small, elongated form, in Toronto Bay.

36. *Anodon fluviatilis*, Dillwyn.

Common in the shallower parts of the lake.

37. *Anodon*, sp.

Common in Toronto Bay, in from one to three fathoms.

VERTEBRATA.

38. *Pimelodus catus* (*P. atrarius*).

The young of this common species of Cat-fish occurred in great numbers at the "Island." Their length was from less than one inch to as much as an inch and a half.

39. *Pomotis vulgaris.*

The young of the "sun-fish," or "Northern Pomotis" of Richardson, also occurred plentifully in shallow water at the "Island." The largest specimen obtained was about two inches and a half in length.

40. *Perca flavescens*, Cuvier.

The American Yellow Perch. Common throughout Toronto Bay.

41. *Leuciscus*, sp.

Two individuals of a small species of this genus were brought up by the dredge in Toronto Bay, from a depth of about two fathoms.

42. *Emys picta.*

The "painted Turtle." Occurred plentifully in shallow water at the "Island."

43. *Menobranchus maculatus.*

A single individual was observed in shallow water at the "Island," but unfortunately escaped capture.

ANALYSES OF CANADIAN MINERALS.

BY E. J. CHAPMAN, PH.D.,
Professor of Mineralogy and Geology in University College, Toronto.

The following analyses of some of our commercial ores and economic minerals were made recently in the assay-office of the writer. It is proposed to publish in the *Journal*, from time to time, additional analyses of similar character.

(1.) SAMPLE OF FLUOR-APATITE FROM THE TOWNSHIP OF BEDFORD (LOT 2, CON. xii).

This sample, of about 2 lbs. in weight, shewed throughout its mass a well-marked lamellar structure and pale apple-green colour. Sp. gr. = 3·18. Average composition:

Phosphate of Lime	88·32
Fluoride of Calcium	7·12
Chloride of Calcium	0·53
Carbonate of Lime (intermixed)	2·33
Sesquioxide of Iron	traces.
Silica	1·57
	99·87

(2.) SAMPLE OF FLUOR-APATITE FROM SOUTH CROSBY (LOT 13, CON. vi).

A lamellar apatite of a mixed reddish and pale-green colour. Sp. gr. = 3·16. Average composition:

Phosphate of Lime	87·92
Fluoride of Calcium	7·08
Chloride of Calcium	0·57
Carbonate of Lime (intermixed)	1·26
Sesquioxide of Iron	0·27
Silica	2·72
	99·82

NOTE. — In these commercial analyses, after separation of the intermixed carbonate of lime and the siliceous rock matter, the lime, phosphoric acid, and chlorine were determined directly, and the fluorine was calculated from the amount of lime in excess of that required by the phosphate and chloride. When the crushed mineral is warmed with sulphuric acid, the evolved fumes exert a strongly-marked corrosive action on glass. The samples analysed were not obtained personally, but they were said to represent fairly the general

character of the deposits from which they were taken. Very probably, however, these deposits when opened out will be found to contain a larger percentage of intermixed carbonate of lime and siliceous matter than is shewn in the above analyses. The samples were accompanied by others, labelled equally "phosphate of lime," but which consisted of large greyish-green crystals of pyroxene, much resembling apatite to an unpractised eye, but easily distinguished in most cases by their shape. In some, nevertheless, the prisms were six-sided, or composed of the four ordinary prism-planes, with the two planes of the front or ortho-pinakoid, the clino-pinakoid faces, so commonly present, being either wanting or reduced to mere lines. One of these samples was marked "Osso: Crow Lake."

(3.) Iron Ore from the Township of Bedford.

This sample consisted of black, strongly magnetic ore, shewing polarity, and presenting a cleavable structure. Sp. gr. = 5·05. The average composition was as follows:

Protoxide of Iron	26·93
Sesquioxide of Iron	59·39
Sesquioxide of Manganese	trace only.
Alumina	0·67
Magnesia	0·82
Lime	0·33
Titanic Acid	3·23
Phosphoric Acid	trace only.
Sulphur	0·07
Silica and siliceous rock-matter	8·38
	99 82

Metallic Iron = 62·52 p.c.

Note.—Another sample of magnetic ore of a very similar character, also from Bedford, but said to have come from a different deposit, was found to contain 5.11 p. c. titanic acid, with 29.03 protoxide, and 56.52 sesquioxide. When titanic acid is present, the amount of protoxide of iron seems to be always in excess of the amount normally present in the magnetic compound. The percentage of titanic acid does not appear to be always constant in the same deposit. A sample of magnetic ore from South Crosby gave Dr. Sterry Hunt, for example, 9.80 p. c., whilst another portion of this ore was found by Dr. Hayes, of Boston, to hold no less than 16.45 p. c. Hence an ore containing even a small proportion of titanium may be viewed with a certain amount of suspicion as regards its ulterior yield. The presence of titanium does not, of course, affect the quality of the reduced metal, as the whole of it, or essentially all, goes into slag. But it affects the quality of the ore, and in three ways: first, by taking the place of iron in the ore; secondly, by rendering the ore, in general, more refractory; and thirdly, by carrying off a certain amount of metal in passing into slag. Where the amount of titanic acid in an ore does not exceed, however, 4 or 5 p. c., it is of no material consequence.

(4.) Iron Ore from Thunder Bay, Lake Superior.

This sample consisted of fine-grained magnetic ore, comparatively light in colour, very hard, and breaking with irregular splintery fracture. Sp. gr. = 4·98. Its analysis shewed:

Protoxide of Iron	25·87	26·18
Sesquioxide of Iron	58·48	58·70
Sesquioxide of Manganese	0·34	0·27
Silica	15·46	14·68
	100·15	99·83
Metallic Iron =	61 p.c.	61·36 p.c.

Note.—This ore contains merely faint traces of titanium, phosphorus, and sulphur. The large per centage of silica detracts, however, greatly from its otherwise pure quality. Unless carefully slagged by a large addition of suitable flux, the silica would eat into the furnace lining, and would also rob the ore largely of metal in passing into slag. The extreme hardness and splintery nature of this ore are likewise objectionable features.

(5.) Auriferous Mispickel from Marmora (Lot 7, Con. ix).

The sample subjected to assay was obtained personally from a depth of about 70 feet below the surface of the ground. It weighed thirty-six pounds, and gave the following results:

(1.) *Crushed sample, as brought to surface.*

Gold ...2 oz., 13 dwts., 16 grs.=$55 44....
Silver ..... 4 dwts., 16 grs..... } Per Ton of 2000 lbs.

Gold....3 oz., 0 dwts., 12 grs.=£12 10s. stg
Silver ..... 5 dwts., 5½ grs..... } Per Ton of 2240 lbs.

(2.) *Sample partially freed by rough dressing from intermixed quartz.*

Gold....4 oz., 6 dwts., 8 grs.=$89 18....
Silver ..... 7 dwts., 0 grs..... } Per Ton of 2000 lbs.

Gold ...4 oz., 16 dwts., 17 grs.=£20 stg....
Silver ..... 7 dwts., 20 grs..... } Per Ton of 2240 lbs.

(3.) *Portion of pure or nearly pure mispickel.*

Gold....5 oz., 5 dwts., 0 grs.=$108 46...
Silver ..... 9 dwts., 8 grs..... .... } Per Ton of 2000 lbs.

Gold ...5 oz., 17 dwts., 14 grs.=£24 6s. stg.
Silver .....10 dwts., 11 grs..... .. } Per Ton of 2240 lbs.

Note.—These essays, published in a report on the Dean and Williams Mine last December, fully confirm the fact to which attention was first called by the writer some time ago, that the true ore of gold in the Hastings District is the mineral Mispickel. As this ore occurs abundantly throughout North Hastings, and is everywhere more or less auriferous, the amount of gold locked up in it in that part of the Province alone must be exceedingly great. It is equally auriferous, and has been equally neglected, in Nova Scotia.

THE HORITES.

BY THE REV. JOHN CAMPBELL, M.A., TORONTO.

The student of Biblical History cannot fail to notice the remarkable prominence given to one supposed Canaanitish people over all others mentioned in the Pentateuch. This is the tribe of the Horites, who dwelt in their mount Seir. The first mention of this family is in Genesis xiv. 6, where they are numbered among the peoples defeated by Chedorlaomer and his associates. In Deuteronomy ii. 12, 22, they are again spoken of as the ancient possessors of the land occupied by the descendants of Esau. Bishop Patrick supposed that the Horites had dwelt in that region since the days of the Deluge, although he did not suggest a line of Noah's descendants with whom they might have been connected.[1] In Genesis xxxvi. a singularly minute and full account is given of the families of this people, the only apparent reason for it being that Esau and his son Eliphaz married women of their race, and that the Edomites dwelt with them in the land of Seir. The genealogies of the Horites there given are as follow :

"These are the sons of Seir the Horite, who inhabited the land ; Lotan, and Shobal, and Zibeon, and Anah, and Dishon, and Ezer, and Dishan : these are the dukes of the Horites, the children of Seir, in the land of Edom. And the children of Lotan were Hori and Homam ; and Lotan's sister was Timna. And the children of Shobal were these ; Alvan, and Manahath, and Ebal, Shepho and Onam. And these are the children of Zibeon ; both Ajah, and Anah : this was that Anah that found the mules in the wilderness, as he fed the asses of Zibeon his father. And the children of Anah were these ; Dishon, and Aholibamah the daughter of Anah. And these are the children of Dishon ; Hemdan, and Eshban, and Ithran, and Cheran. The children of Ezar are these ; Bilhan, and Zaavan, and Akan. The children of Dishan are these ; Uz, and Aran. These are the dukes that came of the Horites ; duke Lotan, duke Shobal, duke Zibeon, duke Anah, duke Dishon, duke Ezar, duke

[1] Commentary on Genesis. Ch. xxxvi.

Dishan: these are the dukes that came of Hori, among their dukes in the land of Seir." Genesis xxxvi. 20-30. Among these we find that Anah, the father of Aholibamah, is (Gen. xxxvi. 2) the son of Zibeon; it is, therefore, probable that Dishon, the father of Hemdan, &c., may be the son of Anah. This would reduce the number of lines to five. If, however, Timna, the concubine of Eliphaz, the son of Esau (Gen. xxxvi. 12), be the same as Timna, the sister of Lotan, it is manifestly impossible to make Lotan a contemporary of Zibeon, Anah, or even Dishon. Zibeon must have lived about the time of Abraham; and Shobal, Ezar and Dishon, if they are his brethren, at the same period. The importance of this Horite line may be judged from the fact of its reappearance in the first chapter of the first book of Chronicles, where the above genealogy is given with some slight variations in the orthography of the individual names.

It is, to say the least, remarkable that a genealogy connecting with the family of Abraham in a way comparatively unimportant should be given at such length. Esau had other wives, Hittites, of Elon and Beeri, yet nothing appears concerning their families but the names of their fathers. Now the Hittites were a powerful people even at the time of Esau, and waged successful wars with many of the Pharaohs in later years. True, we find a brief account (Gen. xxii. 20) of the immediate descendants of Nahor, the brother of Abraham, from whose family came the wife of Isaac and the two wives of Jacob; but this is not to be wondered at seeing that these were so intimately connected with the great patriarch himself. The sons of Abraham by Keturah, the children of Ishmael, and those of Esau, are, as we might expect, named, in some cases, with their grandsons. But nothing is recorded of the families to which Hagar, or Keturah belonged; the name of Ishmael's wife is not even mentioned; and no genealogy enlightens us in regard to the connections formed by the heads of the Twelve Tribes. A simple mention of the immediate progenitors of Aholibamah would not have been matter of great surprise; but this long Horite genealogy certainly ought to be so with every serious student of the Mosaic record.

Still more extraordinary should this list appear, if, as almost all writers who have treated of them suppose, the Horites were an obscure race of uncivilized troglodytes, whom the Edomites without much difficulty extirpated. Strange that the great lines of Egypt and Assyria should pass without notice; that the powerful families

of Moab and Ammon should have no record; that Ishmael's grandsons do not appear; and these miserable cave-dwellers have so much of Scripture allotted to them! Whatever view we may be inclined to take of the books of Moses, whether we regard them as an inspired production, or the work of a man wise beyond all his fellows, the problem remains the same. What is the Divine purpose in giving such a genealogy? or what was the end of the historian in placing it on record?

An objection naturally urged against the attempt to answer such a question is, that neither sacred nor profane history gives us any more information regarding the Horites. This I deny; for I profess to have opened the door at which many have knocked in vain, and from induction of facts historical, mythological, philological, and geographical, to be able to prove the truth of the following six propositions regarding this ancient people:

I. That the Horites were no obscure troglodytes, but a race preeminently noble and distinguished.

II. That they have left distinct geographical traces in and about Palestine, which find their counterparts in other lands.

III. That one family of the Horites appears, in a somewhat disguised form, in the second and fourth chapters of the first book of Chronicles, and there furnishes the link of connection with other histories than that of the Bible.

IV. That in this family we find many of the divinities and some of the earliest rulers of Lower and Upper Egypt.

V. That from this family came the Caphtorim, who invaded Palestine before the close of the wanderings of Israel.

VI. That reminiscences of the Horites, and confirmation of all the preceding propositions, are found in the early history and mythology of Phœnicia, Chaldea, Arabia, Persia, India, Asia Minor, Greece, Italy, and of the Celtic and German peoples.

I proceed at once to the proof of the above six statements, the first two being simply introductory, and depending greatly for confirmation upon the establishment of the third and following propositions.

I.—THE HORITES WERE NO OBSCURE TROGLODYTES, BUT A RACE PREEMINENTLY NOBLE AND DISTINGUISHED.

We have already seen that some of the heads of tribes or dukes of this race were contemporaries of Abraham. Their ancestor Seir, and that other ancestor Hori, mentioned in Gen. xxxvi. 30, who cannot be the son of Lotan, take us back to an older period still. In Abraham's time they were of sufficient importance to attract the attention of Chedorlaomer, and dwelt at no great distance from the cities of the plain, "the opulent Pentapolis of the Jordan." They are classed with the Rephaim, the Zuzim, the Emim and the Avim, whom there is strong reason for making Japhetic peoples connecting with Riphath, Javan, &c., more especially as their names do not occur among the tribes of Ham. They represent a second wave of population moving westward from Babel, the first being a purely Hamitic stock that had passed over Jordan and probably into Egypt, in both of which regions they soon became the serfs of a nobler race. The Shemites, with the exception of Abraham and his family, still kept to their ancient seat. Esau, a proud and warlike man, was not ashamed to ally himself with a Horite princess. He seems, indeed, to have entered upon this alliance on unequal terms, inasmuch as certain of the dukes of Esau (Gen. xxxvi. 40), Timnah, Alvah, Aholibamah, bear Horite names, while no Horite duke bears the name of an Edomite. It is also to be noted that two of these are the names of females, although they stand at the head of the list of the Aluphim or dukes. In ancient times for a woman to give her name to a family was a mark of high honour, and such, undoubtedly, was the position that the Horite element occupied in the Edomite family. Obadiah iii. is often quoted as a passage which proves the Horites to have been troglodytes, inasmuch as the Edomites, who supplanted them, are there described as dwelling "in the clefts of the rock;" but who will dare to call the proud, free and warlike Edomites cave-dwellers? A better name should be found for those whose skill and marvellous industry fashioned the palaces of Petra, leaving marks of a high civilization, that nothing but a great convulsion of nature can efface, whether they be Edomites or the sons of Hori. These troglodytes, if men will call them so, were a great people. It is interesting to observe that Josephus calls the descendants of Abraham by Keturah by the same name, and yet represents them, quoting the words of an ancient historian, as the conquerors of Egypt and founders of the Assyrian Empire.[2]

[2] Josephi Antiq. Lib. I. Cap. 15.

But, apart from these facts, the primary meaning of the root Hor or Chor, for the initial letter is the Hebrew Cheth, is not a cave-dweller. It would be strange indeed if it were. The word is an adjective, and means white, pure, and hence noble. The interpretation *troglodyte* is a conjectural one, derived from false historical reasoning. In so far as the meaning obtains in the Hebrew language, it denotes historical corruption of the original sense, such as we find in our English words *pagan* and *villain*, *Whig* and *Tory*, or, better still, in the word *Bohemian*. As well might later writers pretend that the original Bohemians were a horde of vagabonds, as those of the present day, that the Horites were a race of miserable dwellers in caves. The children of Seir, the Horite, were the white race of their age, the purest of all the Japhetic families, the nobles of the world's early history. Their name is a synonym for all these qualities in many tongues, and especially in those of the Indo-European class. The Greek *heros, a hero, or demi-god*, with *Hera the mistress*, as a name of Juno, the German *Herr*, and hence, by the conversion of the aspirate into a sibilant, our English *Sir*, are a few of the later forms of this famous word, which fills a large part of the vocabularies of many languages.[2*] It appears in connection with the number seven, representing the seven dukes of that princely family, in the *seven Harits*, the bright ones of Sanskrit mythology; and these, with the preservation of the guttural or strongly aspirated Cheth, meet us again in the seven Greek *Charites*, or, without it, in the seven *Horae* of the same theogony. This is hardly the place yet to enter upon the connection of the names of the individual Horites with those which appear in the history of the Indo-European families. Still, I may be permitted here to indicate some of the links that bind the Scripture genealogy to the traditions of ancient nations. Lotan is a root that appears in Latona, Latinus, and many other venerable names; nor is it unworthy of attention that, as Latona is the mother of Horus Apollo, so Lotan's eldest son bears the identical appellation, Hori. Shobal, which connects with *Shibboleth, an ear of corn*, is, as Hyde unwittingly shows, the Arabic Sambula, which he makes equivalent to the Greek Sibulla, and also to the Latin Spica, meaning the same thing.[3] In Aholibamah we have, I am assured, the original

[2*] Guigniaut, Religions de l'Antiquité, iii. 833, seq. Fuerst in his valuable lexicon gives Phœnician Hor or Chor, the meaning of which is *noble* and *free*.

[3] Hyde, Religio Veterum Persarum, 398.

of the Greek Olympus, in the Ionic dialect *Οὔλυμπος*, a word for which no derivation can be found, and all the associations of which agree admirably with the meaning of the Hebrew term "tent of the high place." The very word *bamah, the high place*, survives in the Greek *bema*. I shall yet have occasion to show the force of the following Homeric gloss upon the words of Moses. Speaking of the children of Zibeon the sacred writer says, "This was that Anah that found the mules in the wilderness, as he fed the asses of Zibeon, his father." The words of the Greek poet are:[4]

"Παφλαγόνων δ' ἡγεῖτο Πυλαιμένεος λάσιον κῆρ,
Ἐξ Ἐνετῶν, ὅθεν ἡμιόνων γένος ἀγροτεράων."

"The rough heart of Pylaemenes led the Paphlagonian
Eneti, whence is the stock of wild mules."

II.—THE HORITES HAVE LEFT DISTINCT GEOGRAPHICAL TRACES IN AND ABOUT PALESTINE, WHICH FIND THEIR COUNTERPARTS IN OTHER LANDS.

In the neighbourhood of the Dead Sea I might mention the district long known as Syria Sobal, which commemorates the second of the Horite dukes.[4*] Among his sons, Manahath gives name to a place spoken of in the 6th verse of the 8th chapter of first Chronicles, the site of which is unknown. It may have been Minois, near Gaza in Philistia, or, as probably, the Mendesian nome of Lower Egypt. As for Ebal, the third son of Shobal, a mountain in Central Palestine bears his name; and the region of Gebalitis in the vicinity of, or included in, Syria Sobal, shows the simple conversion of an initial Ayin, represented falsely in our English version as an unaspirated letter, into a corresponding Gimel. The root Shepho is so common a one that I hardly dare trust myself to point out its geographical connections. Onam will be seen by any one capable of consulting a Hebrew lexicon to be of the same root as that which occurs in Ono, a town of Benjamin, and On, the celebrated city of the Sun, in Egypt. Bethana is the house of the god Anah, also called Anammelech or Anah the king. Among the sons of Dishon, I need only select Eshban, a word which Gesenius identifies with

[4] Homeri Iliad. ii. 851-2. The same Eneti introduced mules into Spain. They are the Anites descended from the son of Zibeon.

[4*] Ritter's Comparative Geography of Palestine, Edin., ii. 134. Keil and Delitsch (in Gen. xxxvi.), good men but typical commentators of the unhistorical class, sneer at the idea of a connection between Syria Sobal and Shobal the Horite. The name appears indeed in an apocryphal book, but is no more an apocryphal name than Gebalitis.

Heshbon in Moab.[5] Among those of Ezar, Akan, or, as he is called in 1 Chronicles i. 42, Jakan, gives us the important family of the Beni Jaakan, dwelling in Arabia Petræa (Numbers xxxiii. 31). Of the sons of Dishan, Uz appears to have been the first or most important settler in the land of which the patriarch Job was an inhabitant.

Dr. Hyde Clarke has already shown in several of his admirable papers, that the geographical names of Palestine are those of the world.[6] The majority of these names I have good reason to believe are eponymous. The Horites, who left little or no traces in Palestine, on account of their early emigration to other lands, did not, on that account, suffer their names to perish, but still "called their lands by their own names" in whatever part of the world these were situated. Latopolis in Egypt and Latium in Italy represent Lotan. Hori gives Heroopolis, also in the land of the Pharaohs, and unnumbered similar designations of towns in Europe, Asia, and Africa. Shobal appears in the Lydian Sipylus and in the great Sabellian family of Italy. Alvan, or, as he is called in 1 Chron. i. 40, Alian, furnishes the Egyptian Ilahoun, and the famous city Ilium of the Troade. Manahath is the founder of Mendes, and Mandara or Month-ra, and also had his name conferred upon Monetium of the Japodes, like the Eneti, an Illyrian people.[6*] Ebal, in the form of Gebal, appears in Phœnicia, and the character of the initial sound is at once seen in the form Byblus, which consists in the prefix of the Coptic article. Onam we have already connected with On or Heliopolis in Egypt. The Colchian city Æa may be a reminiscence of Ajah, while Anah is almost proved to be the progenitor of the Eneti by the fact that their ancestor in the Welsh mythical history is Gwynn, a word which reproduces the power of the initial Ayin of the Hebrew name.[7] The sons of Dishon seem to have sent colonies to Persia, for Hamadan, Ispahan and Teheran are too near Hemdan, Eshban and Ithran to be accidental. In Eshban we also find Hispania, while Ithran and Tyrrhenia agree. As for Cheran, no form is more common in universal geography. Aziris in Libya, and

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[5] Gesenii Lexicon *in loc.*

[6] I beg here to express my public acknowledgment of Dr. Clarke's valuable suggestions in connection with the special subject of this division of the paper; although the field to which I have confined my attention principally is geographically, and perhaps chronologically, different from that in which he has pursued his important investigations.

[6*] We find Soba, Alva and Mandara in close proximity. Lepsius' Letters, 163.

[7] Davies' Celtic Researches, 167.

many similar names in Syria and Asia Minor, remind us of Ezer. Like correspondences are found with the remaining eponyms of the Horite family. The question has often been asked, Whence came the Phœnicians, that ancient and distinguished people? Herodotus and other writers tell us that their own account brought them from the shores of the Red Sea.[7*] Now, on these shores we find the Beni-Jaakan of the sons of Ezer, and this compound word, not the Beni-Anakim of Bochart, is the original of the national designation Phœnician.[8] It may seem that thus I reduce all the civilized peoples of the world to one ancestry, and represent the Horites as the one people of antiquity, in the same way as older writers have dealt with their Arkites, Atlantides, Cushites, &c. This, however, is not the case. There are, at least, six other families of little less importance, and many more which contributed largely to early civilization, that I hope in time to bring under the notice of the student of ancient history.[9] That we find the Horites, or reminiscences of them, in nearly every country need not be matter of surprise, for what has been often remarked in regard to the mixture of peoples in the populations of Greece and India is true of almost every land possessing a history. There is no such thing as a pure civilized race.

III.—One family of the Horites appears, in a somewhat disguised form, in the second and fourth chapters of the first book of Chronicles, and there furnishes the link of connection with other histories than that of the Bible.

A serious objection assails me upon the threshold of proof. It is this. The second chapter, and part of the fourth, of the first book of Chronicles profess to contain the genealogies of the sons of Judah. Under what pretence, then, can I introduce the Horites? I answer, upon several good grounds. In the first place, mention is made in these genealogies of men who certainly were not Jews. Such (1 Ch. ii. 55) are the Kenites, that came of Hemath, the father of the house of Rechab, a line mentioned in the second verse of the 35th chapter of Jeremiah. Such, also, are the Kenezites, first mentioned in the 19th verse of the 15th chapter of Genesis, and to whom Caleb, the son of Jephunneh (Numbers xxxii. 12, Joshua xiv. 6), is said to have

7* Herodot. vii. 89. Strabonis Geog., 766.

8 Bochart, Canaan i. i. 347.

9 Such are the sons of Salma and Hareph (1 Chron. ii. 51, 54), the Jerahmeelites (ii. 25), the children of Etam (iv. 3), of Ashchur (iv. 5), of Coz (iv. 8), of Kenaz (iv. 13), of Ezra (iv. 17), &c.

belonged. Their genealogy is given, 1 Chron. iv. 13, &c. In the ninth verse of the same chapter, Jabez is more honourable than his brethren, because he called on the God of Israel, not, we may conclude, on his own gods, as his brethren were in the habit of doing. Jabez was no Israelite. In the eighteenth verse, a daughter of Pharaoh marries Mered (literally the rebel), a most unlikely name for a descendant of Judah. He is doubtless prince Mourhet, who is said to have married a daughter of Cheops, and whose features, as represented on the Egyptian monuments, are not at all Jewish.[10] In the 19th verse, we read of Eshtemoa, the Maachathite; but the Maachathites (Deut. iii. 13, 2 Sam. x. 6), were, with the Geshurites, an independent people, who at times warred with the Israelites. Who can throw light upon the "ancient things" of verses 21-3? With what king of Israel do those, who had dominion in Moab, connect as his servants?

The names of the supposed descendants of Judah are not Jewish. What Jew would call his son Caleb (a dog), a name which so frequently occurs and in the greatest confusion? The family mentioned in chapter ii. 43-45, is from its names clearly Midianite, and two of the names in chapter iv. 25, are Ishmaelite. The second chapter, as far as the 17th verse, seems to contain, with a few interpolations, a record of the children of Judah; the whole of the third is taken up with the family of David; but I have no evidence, beyond the words of the first verse of the fourth chapter, "The sons of Judah; Pharez, Hezron, and Carmi, and Hur, and Shobal," that the families mentioned in it were Israelites in any sense of the term. The 23rd chapter of second Samuel, and the 11th chapter of the book we are considering, shed some light upon the nationality of those mentioned in its second and fourth chapters. In the 54th verse of the second chapter, the Netophathites are mentioned, and the Ithrites in the 53rd verse, while the head of Tekoa appears in the fifth of the fourth chapter, and a Maachathite in the nineteenth. Now, in the chapters above mentioned (2 Sam. xxiii., and 1 Chron. xi.), we find Maharai and Heleb, Netophathites, Ira and Gareb, Ithrites, Eliphelet, the Maachathite, and another Ira, a Tekoite. I might also compare Hushah, the son of Ezer (1 Chron. iv. 4), with (2 Sam. xxiii. 27 and 1 Chron. xi. 29), Mebunnai and Sibbecai, the Hushathites. It may be said that these are still Israelites, taking their

[10] Nott and Gliddon in their joint ethnological work, p. 177. Osburn, Monumental History of Egypt, i. 454, seq. Lepsius' Letters, 61.

names from the towns they inhabited. If so, why is Ittai (2 Sam. xxiii. 29) called a Benjamite, Bani (2 Sam. xxiii. 36) a Gadite, and Adina (1 Chron. xi. 42) a Reubenite? It cannot be said that Zelek, the Ammonite, Ithmah, the Moabite, Nahari, the Beerothite, and Uriah, the Hittite, who are mentioned (2 Sam. xxiii. 37, 39, 1 Chron. xi. 46) together with them, are Israelites. There is more historic truth than men are aware of in the words of the Apostle Paul, "For they are not all Israel which are of Israel." It is plain, not only that many had, like Caleb, part and lot with Israel in the land of promise who were not descendants of Abraham, but that the kingdom of Israel, in the time of David, consisted of a number of different nationalities. The line of Jerahmeel, which is given in 1 Chron. ii. 25-41, is not an Abrahamic family, although I do not deny that there may have been a Jerahmeel in the line of Judah. We meet with these Jerahmeelites in 1 Sam. xxvii. 10, where David is represented as telling Achish that he had made a road against the south of Judah, and against the south of the Jerahmeelites, and against the south of the Kenites, as if they were three distinct peoples. Also, in the 30th chapter, the Jerahmeelites and the Kenites are spoken of as dwelling in cities, while the same is not said of any of his confederates and friends to whom David sent presents. In connection with this passage, as showing the position of Caleb the Kenezite, we find (verse 14) the Egyptian slave deserted by the Amalekites saying, "We made an invasion upon the south of the Cherethites, and upon the coast which belongeth to Judah, and upon the south of Caleb." The Cherethites have been clearly shewn, and are now generally allowed to have been, Cretans; and Caleb's descendants are no less thoroughly distinguished from the people of Judah than are these Japhetic warriors.

I might dwell upon the antiquity of Bethlehem Ephratah, which (1 Chron. ii. 19, 24, 50) derives its name from Ephrath, the wife of Caleb, the father or son of Hur, for there is contradiction here; an antiquity which is well shewn (Gen. xxxv. 16, 19) by its possessing that name in the time of Jacob. Yet Caleb is the great-grandson of Judah by a very late connection. It is somewhat strange that none of the great names of these genealogies, if we except the immediate descendants of Judah, and Caleb the son of Jephunneh, ever appear in any other part of the Bible. With the exception of the ancestors of David, and the families of the Levites in the sixth chapter, the

lists are utterly useless for genealogical purposes; and we have no record that the twelve tribes ever employed them for such an end, or even that the most learned of their rabbis have been able to reduce them to order. It is utterly impossible to reduce them to order, on the hypothesis or understanding that they represent the descendants of Judah, Benjamin, &c. The Ram and Hur and Salma of Judah cannot be reconciled with those of the same name afterward mentioned; neither can the Beni-Jamin of the seventh chapter be made to agree with the children of Jacob's youngest born. What, then, it may be asked, is the alternative? The books of Chronicles are of low canonicity—for the Jew places them at the end of the hagiographa. Shall they be deemed unworthy of the canon? Far from it. I regard the first book of Chronicles as one of the most valuable books in the Old Testament Scriptures. It contains what is found in no other book in the world, a brief but most comprehensive record of all the great families of antiquity. It embraces a large Gentile genealogy, or series of genealogies, overshadowing those of the Hebrew people; and this accounts for the mystification of all the Jewish doctors. They never thought of looking in the inspired writings of their canon for a sign of the Divine interest in all the nations of the earth, beyond that furnished in the tenth chapter of Genesis.

The books of Chronicles are among the least edited, even at the present day, of all the books of the Bible. The versions of these books differ widely, to an extravagant degree, in the names given in the first few chapters of the first book and in other particulars.[11] It may yet be found by scholars possessing greater Oriental erudition and greater facilities than I can command, that the connection of the sons of Jacob with these Gentile families is the result of ancient rabbinical interpolation; and that a well meant, but injudicious, attempt to clear up a mystery has led to the serious confusion that so frequently appears. I may state here, once for all, that nothing short of the most serious and long settled conviction of the truth and important reality of my discovery could induce me to cast a doubt upon the presently received views in regard to this portion of the Sacred Volume. With the Apostle Paul I trust ever to be able to take as my motto, "We can do nothing against the truth, but for the truth," meaning by that Truth the inspired Word of God,

[11] *E.g.*, The Septuagint and Syriac versions.

whether that inspiration regard matter of doctrine or of history. In the meanwhile, I assume the correctness of our present Hebrew version of the first book of Chronicles, and, to account for the presence of the Gentile names which I find in the first few chapters, suggest the following hypotheses:

1. *Together with the descendants of the sons of Jacob, there may have been included in the lists their connections by marriage.*—This, except in the case of Bithiah the daughter of Pharaoh, and the Kenites (Judges iv. 11), who should have been numbered among the descendants of Levi rather than of Judah, I cannot perceive.

2. *Or, together with them, there may have been included a mixed multitude of other races that had suffered oppression along with them in Egypt, and had part in their deliverance.*—This might help to satisfy Dr. Colenso's doubts, and is true in so far as the Kenites and some of the Kenezites are concerned. It must, however, make the list retrospective, giving the ancestors of these fugitives back to or beyond the time of Abraham. Even thus, my investigations have shewn me that it will not account for all the lines mentioned, many of whom had little or no late connection with Palestine.

3. *Or—and this I think is the truth—Southern Palestine was the great centre of a later dispersion than that of Babel, being the highway to Egypt and Arabia, Syria, and Asia Minor; and the Mosaic narrative, looking rather to geographical than tribal descent, gives here the eponyms of the various states and cities into the possession of which Israel entered.*—There is a significance which we do not yet understand in the words of Moses (Deut. xxxii. 7, 8), "Remember the days of old, consider the years of many generations; ask thy father and he will shew thee; thy elders and they will tell thee. When the Most High divided to the nations their inheritance, when he separated the sons of Adam, he set the bounds of the people according to the number of the children of Israel." This hypothesis will account for the immense disproportion between the number of the descendants of Judah and those of the other tribes supposed to be placed on record in these chapters, since they occupied the larger portion of Southern Palestine; although it is true (Numbers i. 27) that the children of Judah were more numerous than those of any other of the sons of Jacob. I now proceed to find among the names connected with the mention of this tribe one of the families of the

Horites, whose position geographically would bring them, if my hypothesis be correct, within its limits.

The only Shobal mentioned in the Bible, apart from the families of the Horites, is one that appears in 1 Chron. ii. 50, 52, and iv. 1, 2. The verses are, "These are the sons of Caleb the son of Hur (called also, 1 Chron. ii. 19, the father of Hur), the first-born of Ephratah; Shobal, the father of Kirjath-jearim. And Shobal, the father of Kirjath-jearim, had sons; Haroeh and half of the Manahethites. The sons of Judah; Pharez, Hezron, and Carmi and Hur and Shobal. And Reaiah (or Haroch) the son of Shobal begat Jahath; and Jahath begat Ahumai and Lahad. These are the families of the Zorathites." Among the families of Kirjath-jearim are mentioned, in the 53rd verse of the second chapter, the Zareathites, whom a glance at the Hebrew text will show to be the same as the so-called Zorathites. The name Hur is identical with the root of the word Horite. As for Caleb he is ubiquitous throughout the second chapter, and his name is, from its meaning, clearly Gentile. Be this as it may, we have a Shobal, itself not an Israelitish name, in connection with other Gentile appellations, and notably with a Hur, who is not the father of Uri, of whom came the wise Bezaleel (1 Chron. ii. 20, Exodus xxxi. 2), and whose name agrees with the Horite parentage of another Shobal, frequently mentioned. He is the father of Kirjath-jearim. Now Kirjath-jearim (Joshua ix. 17) was a city of the Gibeonites, and continued to be so, for the Gibeonites made peace with Israel by artifice. But these Gibeonites were Hivites (Joshua ix. 7, xi. 19), and so also are the Horites called (Gen. xxxvi. 2.) The name Hivite, I am convinced, does not designate Hamitic or any other kind of descent; nevertheless it forms a link to bind Kirjath-jearim and the Horite stock. More important is the fact that the second son of Shobal, the Horite, and of that Shobal who is mentioned in the book of Chronicles, is Manahath, a name unknown in the annals of Israel. Hur, Shobal, and Manahath, form already a threefold cord for the Horite connection. A difficulty appears, however, in the eldest son of the Shobal of Chronicles, who is Ha (the definite article) Roeh or Reaiah, as contrasted with the Alvan or Alian of the Horite. I confess that this staggered me for a time, but disappeared as soon as I began to investigate the meaning of the two words. The name Alvan or Alian is a somewhat Punic form of the word *Elioun, the most high,* and corresponds with the

Arabic *Galyan* (for its initial letter is ayin), meaning *of lofty stature.*[11*] The Punic form appears in the "Alonim v 'Alonuth" of the Pœnulus of Plantus, designating the gods and goddesses.[12] I must here anticipate by introducing the authority of the Phœnician History of Sanchoniatho, which deals with the region about the Dead Sea, Peræa being a primitive seat.[13] He gives, indeed, an older divinity, *Elioun*, whom he makes the husband of Beruth, a kind of Aphrodite or Ephrath, and who would correspond with the father of Hur; but he has a later divinity (no divinity with him however), who in the Greek translation is termed Ilus or Cronus and whose brothers are Betylus, Dagon, and Atlas. Now, Betylus is probably Bethlehem, closely connected with this family, rather than Bethel, as many, like Bishop Cumberland, have supposed. Dagon I shall yet prove to be Onam. As for Atlas, he does not belong to this line at all, but to that of Jerahmeel. The important part of the name Alvan or Alian is the initial Al. The final *n* is valueless, for duke Aliah of the Edomites is clearly of the same name. The *yod* and *vav* are, as we see above, interchangeable; so that the Al remains, denoting in Hebrew and other Shemitic tongues, without any assistance of additional letters, *the Most High, God.* This is the Ilus of Sanchoniatho, who appears along with Dagon on many sculptured walls of Chaldea. He is there called Il, and is the highest of the Babylonian divinities. It is in the Chaldean mythology that we are furnished with the materials for identifying Alvan and Reaiah. Il or Ra, Sir Henry Rawlinson and many other students of Oriental monuments and inscriptions inform us, is the great god of Babylonia.[14] This Ra is an Egyptian term originally, and denotes the sun in the ancient Coptic of the hieroglyphics. The word Roeh or Haroeh divested of the definite article, denotes, according to Gesenius, vision, the sight of the sun; and a corresponding Coptic word connecting with Ra is Ro, the face. But Fuerst, with his usual wisdom, renders Roeh, the All-seeing One, that is, God. Reaiah seems to me an attempt to provide a Hebrew

11* For this meaning of the name Alvan I have confirmation in the high authority of Fuerst. That judicious lexicographer finds in the word *a high, sublime one,* and makes it, as I have done, the same as El and Elioun. Fuerst's Hebrew and Chaldee Lexicon *in loc.*

12 Plauti Poenuli, v. 1.

13 Sanchoniatho's Phœnician History, by Cumberland, 197.

14 Rawlinson's Herodotus, App., Bk. i., Essay x., s. 2, (i.) &c. Both Ra and Il as convertible terms signified "a god" in general, and this agrees with Fuerst's translations of Alvan and Roeh. See below in the text.

name for the son of Shobal, for Gesenius makes it to mean "whom Jehovah cares for," admitting, however, that Haroeh designates the same person. We have in Alvan and Reaiah two words denoting supreme deity. I would only present one additional proof, at this stage, of the identity of Alvan and Reaiah, Il and Ra. It is found in connection with the history of Sanchoniatho. Jehid or Jeoud is named as the son of Ilus, whom he sacrificed to his father Ouranos. Rightly the son of Reaiah bears the corresponding name Jahath. All that I demand at present is a belief in the probability that the Horite Shobal, with his sons Alvan and Manahath, is the same as the Shobal, son of Hur, whose children are Roeh and Manahath. The identification of the Ilus and the Jehid of Sanchoniatho with the Roeh or Reaiah and Jahath of Chronicles is important but not absolutely necessary for the burden of proof.

IV.—In this family (that of Shobal) we find many of the divinities and some of the earliest rulers of Lower and Upper Egypt.

It is now, I think, generally conceded that the earliest population of Egypt entered from the north-east, and must, therefore, if it came by land, as is most likely, have passed through the country of the Horites, and have dwelt for a time, probably, in the south-western corner of Palestine, about the kingdom of Gerar, visited by Abraham and Isaac, but of which we hear nothing in later times. The Scriptures call Egypt Mizraim, and we are therefore justified in believing that the son of Ham of that name was one of the earliest settlers in the land. But it is to be remarked that no race, royal or princely, in Egypt, ever claimed descent from this ancestor. The connection of Mizraim with Menes and others is sheer unfounded hypothesis, and I shall yet show that *Chemi*, a name of this ancient country, bears no reference, as it is often supposed to do, to Ham himself. My own impression, I do not say decided conviction, is that the Hamites, if they exercised sovereign authority at all, did so for a very short time and during a period which is unhistorical, after which they became the subjects of a superior race. Many writers, with Shuckford, have supposed the Horites to be the invaders of Egypt, known as the Shepherd Kings.[15] That they did invade Egypt can be clearly proved, but it was at an earlier period than that of the

[15] Shuckford's Connection of Sacred and Profane History. Original edition, ii. 236.

Hycsos, for the dynasty which these invaders overthrew was Horite. It is worthy of note that among the many races with whom the conquering Pharaohs are said to have warred, and whose names are recorded on various monuments, the Horites never appear.

One of the earliest names of Egypt is Aeria. The Rev. W. B. Galloway, to whom I am indebted for many valuable suggestions, both from personal communications and from his published opinions, together with other writers, connects this name with the AURITAE of the Old Chronicle.[16] These Auritae are given as the first great race of Egypt, including gods, demi-gods, and men.[17] Their gods, indeed, the Egyptians allowed to have been but deified men.[18] These Auritae are the Hor Shesu, servants of Horus or families of the Horites, of the monuments and papyri.[19] I need not tell any student of Egyptian antiquities that Horus is the greatest of all names in the Egyptian mythology. It is an aspirated word, having the form Choris, shewing the power of the Hebrew Cheth, and appears frequently as a termination to the names of many kings, Nephercheres, Tancheres, Zebercheres, &c. In this family several of the principal gods of the Egyptians are to be found. We shall not find Osiris here, nor his near relation Atmoo; these belong to the family of Etam. Neither will Ammon and his son Khensu meet us; these are later, and connect with the son of Lot. The purely solar divinities, the centre of whom is Ra, the sun, are the representatives of the family of Shobal.

The first to engage our attention is the ancestor of the gods of the Auritae. His name is Seb, Sebek, or Seb-ra, and he is Cronus or Time. In him we find the Shobal of Mount Seir. As the Al of Alvan becomes the Ra of Chronicles, so the final *al* of Shobal, although a different syllable, is represented by the *ra* which is affixed

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[16] Egypt's Record of Time to the Exodus of Israel, 136. Mr. Galloway while rightly connecting Aeria and the Auritæ, as Kenrick and many others have done, puts a most just and reasonable faith in the antiquity of both words, in which these writers do not generally agree with him. While agreeing fully with Mr. Galloway in his derivation of the Assyrian line from Egypt and identification of Sesostris with Xisuthrus, I regret that I cannot find with him the word Athyrian or Assyrian in Aeria. The Assyrian line is that of Asshur or Ashcur, whose son Achashtari is Sesostris and Xisuthrus. This line was from an early period inimical to the Horites.

[17] Old Egyptian Chronicle in Cory's Ancient Fragments. There can be no reason for rejecting the name Auritae more than for discarding the two other designations, Mestraei and Aegypti, to which no exception is taken.

[18] This is stated by Diodorus Siculus and others. All the Pharaohs when dead became gods. Lenormant and Chevalier, i. 294.

[19] Lenormant and Chevalier, Manual of the Ancient History of the East, i. 202.

to the name of the Egyptian god. The son of Seb is Ra, the sun, and in him we have the Il or Ra of the Babylonians, and the Alvan or Reaiah of the sacred narrative. A brother of Ra is the deity Month or Month-ra. I am indebted to Mr. Osburn for a confirmation of my identification of the name Manahath with that of this god.[20] Still another is An-ra, connected with On or Heliopolis, and he is Onam, the youngest or last mentioned of the Shobalian brethren. Fuerst points out that the *m* of Onam is a noun termination common among the Edomites. Jahath, or as we may also read it, allowing for the power of the medial Cheth, Jachath, appears in subjection to these, and among the descendants of Seb, as Ati-ra or Achthoes-ra, a name we are yet to become more familiar with. Lower still in order, yet not in point of dignity and importance, is Ahom-ra, and he is the Ahumai who appears as the eldest son of Jahath. Two goddesses connect with this remarkable line. One is Neith, whose name, meaning *to level a bow*, is identical with the Hebrew Nahath, which is the same as Manahath, without the prefixed *Mem*. The other is Hekt, which is simply an abbreviated form of Jachath, the initial *yod* being converted into a breathing.

Some of these divinities were rulers in Egypt. As for Seb or Shobal and Ra or Alvan, we have no evidence that they ever exercised sovereignty in that land. Alvan, whom we have seen to be in all probability the Ilus of Sanchoniatho, ruled, I am persuaded, in the south of Palestine, whence his more adventurous brother Manahath pushed on into Egypt, probably taking with him Onam and Jahath the son of Alvan. I shall yet give good reasons for limiting Alvan to Palestine, and making a probable connection for him with the Abimelechs of Gerar. The region chosen by Manahath for his settlement was Tanis or Zoan in the north-east of the land of Egypt a city built seven years before Hebron in Palestine. It may have been built at that time by Manahath himself, but this I think hardly probable. Close at hand is Mendes giving its name to the Mendesian nome. This Mendes is the city of Month, who is Manahath; and Manahath himself is the first ruler of the Egyptians, the great Menes, whose name and fame descended to all lands as Menu, Minos, Mannus, Manes, Menw, Mingti, and even it may be the Algonquin Manitou. The first ruler of Egypt, and the first lawgiver among all peoples who ever pretended to the benefits of Egypt's early civilization, is the second son of Shobal the Horite.

[20] Monumental History of Egypt, i. 341.

A little later than Manahath we find Onam. Not contented to share his brother's empire or to occupy the position of a subject, he turned southward, and, a little below the point of divergence of the Nile's various branches, founded a town, which he named after himself, On, the strong city of the Sun, also called An-ra. There he kept regal state for some years, until a new invasion drove him from the throne; and his descendants the Anu, after threatening Egypt for a time from the coasts of Arabia Petraea, withdrew at last to Chaldea.[21] On the lists he appears as Onnos; but his name as found upon the monuments is An, represented by the figure of a fish.[22] There can be no doubt that he is the Babylonian Oannes or Dagon, so intimately connected with Ilus, none other than his oldest brother Alvan.[23]

I cannot tell precisely at what period Jahath or Jachath, the son of Alvan or Reaiah, began his unhappy reign, whether during the life of his uncle Manahath or after his death. He is Achthoes, the cruel king of Heracleopolis, who was killed by his guards and Hercules, according to the lists. There are or were at least three towns in Egypt called Heracleopolis, two of which were in the Delta, one at its eastern and the other at its western extremity, while the third was situated on the left side of the Nile below Lake Moeris. It is probable that Achthoes inhabited and ruled over the town to the east of the Delta, not far from the dominions of his father Alvan on the one hand and those of his uncle Manahath on the other. He is fully identified with the solar line of Seb,[24] and his name is read Ati on the monuments, where he is also represented as a monarch cut off in the flower of his age. This may agree with the statement of Sanchoniatho as to the unhappy fate of Jehid or Jeoud, the son of Ilus. This Jachath or Achthoes was confederate with Nesteres, the son of Usecheres, whom I will yet show to be Ha (the definite article) Ahashtari the son of Ashchur (or as our English version of the Bible erroneously reads Asshur), a great name in a distinguished family, the Ashtar of the Shepherd Kings.[25] He, however, is no Horite, and for the present must be dismissed. Nesteres or Ahashtari and Achthoes together made war upon Onam or Onnos, the

[21] Lenormant and Chevalier, i. 205, ii. 359.

[22] Osburn, i. 311.

[23] Bonomi, Nineveh and its Palaces, 330, quotes some valuable remarks of Miss Fanny Corbeaux, connecting On and Dagon.

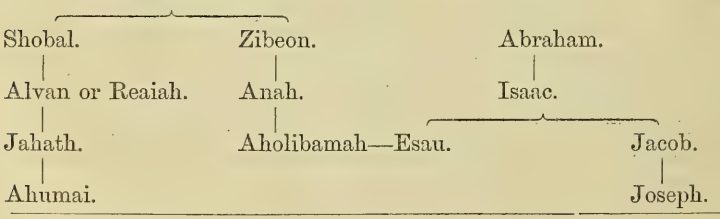
[24] Osburn, i. 373.

[25] Id., ii. 522.

uncle of the latter, and the conclusion of the war was a treaty, one of the provisions of which was the marriage of a daughter of Onnos to Achthoes, who was thus united to his cousin. Achthoes holds a high position among the Pharaohs, and spite of his traditional cruelty and unhappy end, is frequently referred to by later monarchs, who trace their descent from the Horites of the line of Seb.[25*]

The death of Achthoes or Jachath and the Shepherd invasion, which is really the period of the supremacy of Ashtari and his family, were coincident. The line of Seb, or, as he is at times called, Sebek, just as Sibulla gives Spica, was driven out of Lower Egypt, and had to take refuge at Coptos.[26] There dwelt the descendants of Achthoes, the children of Seb, the worshippers of Horus, the religious faction or party known as the Mentcherian (Month-Hor). The head of this Upper Egyptian monarchy was the son of Ati or Achthoes, whose name on the monuments and in the lists varies between Ahmes and Kames. In Kames, the initial vowel is wanting, and its absence brings out the full power of the Hebrew Cheth of Achumai. He is also the head of the family, which, gathering strength in the south, rose at length in rebellion against the Shethite power, and reasserted the dignity of the line of Horus. His brother Lahad I have not yet identified. I am not satisfied that he is Alites or Salatis; yet Lud, an ancient name of the Egyptians, seems to connect with him. There are links to bind the stock of Jahath to Lower as well as to Upper Egypt at this period, and it is possible that Lahad may have taken part in his brother's expulsion. With Newton, however, "hypotheses non fingo."

It is interesting to note the date of this division of the Egyptian empire, as it is afforded us by the statements of Scripture. We may conclude that Shobal and Zibeon were contemporaries, Shobal, if anything, being a little earlier than his brother.



25* For the connection of Seb, Achthoes, Mencheres, and Onnos, see Osburn, i. 373, &c.

26 Osburn, ii. 64, &c.

According to the above table, Ahumai and the patriarch Joseph are contemporaries, so that Joseph appears properly in Egypt during the period of the so-called Shepherd Kings. This agrees with the almost universal tradition that he lived and ruled under Apophis, the greatest of that line.[27] As Apophis, however, was not the first of his dynasty in order of reigning, I am disposed to throw Shobal a little farther, say half a generation, back into the past. With the line that displaced the Horites we have, at present, nothing to do. At their head stands the family of Ashchur, or as he is generally called Usecheres, and, as the central figure in their family, Achashtari, who is at once Ashtar and Sesostris. It was he who overthrew the Horite power in Lower Egypt, and who, once an ally of Achthoes, became the Sheth that stands ever after as the enemy of Horus and all his race. These identifications are given in few words, but are the results of many labours and much patient investigation. They are clearly established in my own mind, and abundance of proof for them will emerge both in this paper and in future accounts of other great families of antiquity. I am convinced that no intelligent Egyptologist will lightly pass by what he must regard, at the least, as a series of extraordinary coincidences, unparalleled in the connections of Sacred and Profane History.

V.—From this family of Shobal, in the line of Ra or Alvan, came the Caphtorim who invaded Palestine before the close of the wanderings of Israel.

Before proceeding with the proof of this statement in itself, I may be allowed to dwell for a short time upon the fact that the southern dynasty founded by Ahumai or Achumai, as Ahmes or Kames, is the dynasty of Syncellus, called that of the Aegypti. Syncellus and other sources of Egyptian history give us three dynasties of rulers in the land of the Pharaohs, the Auritae, whose history we have considered, the Mestraei, and the Aegypti.[28] The Mestraei are the Shethites of Ahashtari, who is called Nesteres by decipherers of the monumental records. The Aegypti are the revived Horite line under Ahumai, who is himself Aegyptus. I proceed to the proof, and in giving it will anticipate somewhat by introducing etymological and historical illustrations from other languages and mythical histories.

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[27] Lepsius' Letters, 480, 487.

[28] Vide Cory's Ancient Fragments.

The region in which the Horite family in the line of Ahumai or Ahmes took refuge, and in which it exercised regal dominion, was that of Coptos. This word has been generally and rightly supposed to be the root of the name Ægypt, the Egyptians themselves being known as Copts. We learn, however, that the ancient name of Coptos was Chemmis, and this Chemmis, the abode of the god Khem or Ahom, gives us as its eponym Kames or Ahmes, otherwise Ahumai. The ancient name of Egypt, as a whole, was Chemi, the land of this same founder of Chemmis. The word Chemi, in ancient and modern Coptic, conveys the two ideas of heat and blackness. Similar roots with the same double meaning are found in Arabic, Syriac, and Hebrew. The Hebrew word Chum is proposed by Fuerst as the root of Achumai, the initial Aleph being prosthetic. It is interesting to note that the symbol of Ahom is the vulture or eagle, and Gyps, the black vulture, has often been supposed a part of the name Aegypt, while the word Ahom represents it. It is also worthy of remark that another name for the Cheops of Herodotus is Chembes or Chemmis.[29] For a similar transformation, I may instance the Latin Cupid as the homonym of the Sanscrit Cama. We have thus five pairs of words serving to illustrate the identity of Ahumai and Ægyptus :

Coptos.	Ægypt.	Cheops.	Gypt.	Cupid.
Chemmis.	Chemi.	Chemmis.	Ahom.	Cama.

In proceeding to identify these two names, I need hardly apologize for introducing Persian connections. I have already pointed out what Herodotus, Diodorus, and other Greek writers so plainly state, that from Chemmis came Ægyptus, Danaus and Perseus, their descendant, the head of the Persian line.[30] Nor are confirmations of these statements wanting. A simple method of proof, allowing the possibility of a Persian connection, lies in an enquiry into the Bible relations of the name Achumai. The nearest word to Achumai is Achmetha, the name of a city mentioned in Ezra vi. 2. The final *tha*, which distinguishes this word from Achumai, is a particle denoting place in many languages. In Hebrew we find Helek, Atarah, Maarah becoming Helkath, Ataroth, Maarath, while Aiath, Kehelatha, Zeredatha, and similar words testify to the same. We

[29] Diod. Sic., i. 63.

[30] The Pharaoh of the Exodus. *Canadian Journal*, Vol. xiii., No. 1.

find it also in the change of the word Chem to Copt. Chemt is almost unpronounceable, and would soon become Chebt. To return, however, to Achmetha. Our English version of Ezra, perfectly trustworthy here, renders it as Ecbatana, but places in the margin, the conjectural reading, "in a coffer or chest." The Greek equivalent of the Aramaic Achmetha, Hebrew Chemeth, *a coffer*, is Kibotos, and that is the name of the ark in which the scattered limbs of Osiris, which were brought to Chemmis, or Coptos, were placed. The words Achmetha and Ecbatana are really the same, in spite of the vast difference of their appearance. The change of an *m* into a *b* (one of the commonest of all changes in etymology), and the affix of another Persian particle denoting a place *(ana)*, account for the variation. Ecbatana, however, in Persian is *Hagmatan*, and is the town of the Persian Achaemenes or Djemschid,[31] the great solar hero, whom Guigniaut and others have identified with the Ahom or Khem of the Egyptians.[32] The sawing of Djemschid in two simply represents the division of the Egyptian Empire in his reign. Whether we translate Achmetha as Ecbatana or Kibotos, we still find an Ægyptus in our Achumai, and in the former case identify him with the head of the Achaemenian Persians. We do not wonder that Cambyses, when in Egypt, claimed to be descended from its ancient kings, and those of a Horite stock.[33]

Sir Gardner Wilkinson settles at once, in few words, the question which has vexed many students of Biblical antiquities—"Whence came the Caphtorim?" The majority of writers, like Hitzig, have taxed their ingenuity to bring them from Crete along with the Cherethites. Now the Cherethites of Palestine never saw Crete. It was doubtless a late stage of their progress that brought a handful of them to that island. Some of the Caphtorim formed part of that migration. But these matters do not concern us at present. One of the names of Coptos, as Sir Gardner Wilkinson has shewn, is Kebt-Hor, a form like Ahom-ra.[34] It was the Coptos of the Horites. Kebt-Hor is the Caphtor of the Bible, and the earliest city of that

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[31] Rawlinson's Herodotus, Book i., Ch. 98, Note 2. See also Book iii., Ch. 30, Note 6. The Persian B, for which the Greeks had no real equivalent, their own B having the sound of V, was replaced naturally enough by the labial most akin to it, M.

[32] Guigniaut, ii. 116, 189.

[33] Lenormant and Chevalier, ii. 97.

[34] Rawlinson's Herodotus, Book ii., Ch. 15, Note 5. Also App., Book ii., Ch. 8, (15th, 16th, and 17th dynasties) Note.

name. From it came the Caphtorim, whom the Scriptures, without the slightest ambiguity, derive from Egypt.[35] The Caphtorim invaded Palestine before the Israelites entered the land, yet, strange to say, we read of no settlements of this people, nor are they spoken of as a nation at the time of Israel's occupation.

The genealogy of the sons of Shobal says nothing of the Caphtorim; but it mentions that Achumai, and perhaps Lahad, were the heads of the families of the Zorathites, whom we have found to be the same as the Zareathites. The root of this name is Zirah, *the hornet;* on this point there is and can be no doubt. An Egyptian traveller in Palestine speaks of a town called Zorah, *a place of hornets*, concerning which he says that the inhabitants were hornets by name and by nature.[36] The Zirah or hornet (Exodus xxiii. 28, Deut. vii. 20, Joshua xxiv. 12,) whom God by the lips of Moses promised to send before his people to drive out the Hivite, the Canaanite, and the Hittite, was no valiant insect even in countless swarms, but a race of men of high lineage and great martial prowess, the descendants of Shobal the Horite, and the Caphtorim, who took their name from Shobal's great grandson, Achumai. It would be strange indeed if any insect pest, according to the ordinary laws of nature and the Divine working, should force great nations out of cities walled up to heaven. Neither did the Israelites find in Palestine a deserted land, but one full of towns, well peopled, and great armies, weakened doubtless, but not destroyed, by the hornet invasion. In Dor and Endor, and many neighbouring places, these Zorathites (for they are the Dorians, and Palestine their Peloponnesus—the home of their fathers which they returned to conquer—as Mazocchi shrewdly guesses),[37] long maintained their independence, and in time passed on to other lands, to be numbered among the most warlike of the peoples of the earth. We may now see a reason for the mention of apparently minute particulars regarding this branch of the human family in the Book of Chronicles. I may add that the hornet appears on the crest of the Egyptian kings of the Horite family.

VI.—Reminiscences of the Horites, and confirmation of all the preceding propositions, are found in the early

[35] Gen. x. 14; Deut. ii. 23; Jerem. xlvii. 4; Amos ix. 7.

[36] Chabas, Voyage d'un Egyptien, quoted by Lenormant and Chevalier, ii. 160. This place must have been Dora.

[37] Anthon's Classical Dictionary; Art. Paestum.

HISTORY AND MYTHOLOGY OF PHŒNICIA, CHALDÆA, ARABIA, PERSIA, INDIA, ASIA MINOR, GREECE, ITALY, AND OF THE CELTIC AND GERMAN PEOPLES.

Phœnicia.—We have already seen that the Phœnicians are a Horite stock, not in the line of Shobal but of Ezer, the father of Akan. In him we must find the Isiris of Sanchoniatho, called by him erroneously the brother of Chna, who was the first to be named a Phœnician. Now Chna I make Akan, and not, as the semi-Hebrew later Phœnicians said, Canaan. Akan becomes Chna by the proper pronunciation of the initial ayin, for which, as in the Arabic, I have always vindicated a sound approaching that of g, the correctness of which appears in the Septuagint very frequently rendering *ayin* by *gamma*. Gakan would be more like the true form of the name of the son of Ezer than Akan or Jaakan. This form gives us the swan of Canaan, one of its insignia, being identical with the Latin cygnus, Greek *Κύκνος*. Let the unshemitic vowels be removed, and we have at once, with slight reduplication, the Chnas, given as the ancestor of the Phœnicians; and this Chnas or Akan we find coming from the shore of the Red Sea, according to the ancient tradition of the origin of the builders of Tyre and Sidon. He is their first king, Agenor or Akan the Horite. I reserve much that I have to say under this head for a future paper on the Phœnicians. Thabion, the Phœnician teacher, who led people astray, may have had the same name, if he be not the same person as Zibeon, the next to Shobal among the sons of Seir.[38] Shobal seems to be lost in the Phœnician story, unless Asbolus, who is obscurely mentioned as the same with Coum, or Achumai or Khem, the son of Belus and nephew of Canaan, father of the Phœnicians, and Mestraim father of the Egyptians, be he.[39] But the Cronus or Time which represents him, or that he represents in the Egyptian mythology as Seb, in Sanchoniatho is applied to his son, Ilus or Alvan, the brother of Onam or Dagon, the husband of Rhea (a word which is simply the Reaiah, Roeh or Ra, by which the eldest of the Shobalians is known), and the father of Jehid or Jeoud. Sanchoniatho plainly says that he went into Egypt, but did not reign there, his kingdom being in Palestine. The story of Sanchoniatho is a venerable record of primeval history, somewhat obscure and corrupted, yet of inestimable value.

[38] Sanchoniatho's Phœn. Hist. 93, 343 seq. Cumberland with a totally different end in view finds that Thabion is a Greek form of an older Zabion.

[39] Sanchoniatho's Phœn. Hist., 115.

Chaldæa.—The Ilus of Sanchoniatho and the Il or Ra of Babylonia are generally allowed to be the same.[39*] In the ancient Belus of that early empire, not that he really ruled in what is known as Babylonia, but his descendants, we have Alvan as Il with the Coptic article in a softened form prefixed, forming, as I have elsewhere shown, the word Baal, which is simply בעל with an initial ב. As for Ninus, he is, doubtless, a nunnated Onam, and the same as Anu, Oannes or Dagon, the Onnos, whose descendants were driven from Egypt into Babylonia. This is, indeed, the derivation given in all ancient records of Oannes and his family.[40] The god of Assyria is Asshur, and in him we have, I am persuaded, a reminiscence of the Egyptian Usecheres or Ashchur, his son Achashtari or Sesostris being the Chaldean Xisuthrus, as I hope yet to have an opportunity of proving at length.[41]

Arabia.—One of the regions in which most naturally we should be inclined to look for traces of the Horites, is Arabia. In the mythology and early history of that country we accordingly find them. An old god known to the Greeks is Dusares, otherwise Dhu-Sair.[42] The word Dhu signifies Lord, and Sair gives us the Bible name Seir. Connected with him is Hobal, a god whose worship was brought from the region of Syria Sobal, and who is the same as Aud, being the Cronus or Seb of the Arabians.[43] The people of Aud or Hobal are the original inhabitants of Irem, in which we find Jearim, the Kirjath or villages of which Shobal and his family inhabited.[44] Intimately allied to Aud or Hobal, as his sons and descendants, are Il or Dhucalyan, Monat, Shedad, Yaguth, Lokman and Lud. In Il, Calyan and Dhucalyan, we find Alian, the power of the initial ayin appearing in the second, and the princely Dhu preceding it in the third. Monat, though a name generally applied to a goddess, as in

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39* The Greek form Illinos given by Damascius, and with which Sir Henry Rawlinson (Rawlinson's Herodotus, App. Bk. i., Essay 10, 2, (111)), connects the Babylonian Il-enu, is more like Alvan or Alian. Guigniaut says Helon or El is the oriental Cronus. (Religions de l'antiquitè, ii. 897.)

40 Cory's Ancient Fragments, 22, 31.

41 The Rev. W. B. Galloway (Egypt's Record, 157) identifies Xisuthrus and Sesostris. Whiston in Josephus (Ant. i. 2, 3) also identifies Seth and Sesotris. Seth, Sheth or Ashtar, the deity of the Egyptian Shepherds, is the same. So is the Persian Tashter and the Indian Tvashtar or Satyavrata. The stories connected with all these names recall an ancient deluge, and a warfare with a Horite line. The children of Sheth (Numbers xxiv. 17), connected in Balaam's prophecy with Moab, are of this ancestry.

42 Guigniaut, iii. 919.

43 Sale's Koran, Preliminary Discourse. Guigniaut ii. 874. Lenormant and Chevalier, ii. 351.

44 Sale's Koran, Preliminary Discourse.

the case of Neith, gives us Manahath. Shedad is Dagon or Onam. Close to On, or perhaps the same place, is Fostat, which is simply a form of Shedad with the Coptic article prefixed, and meaning, like On, the strong city. Again, Dagon is the divinity of Ashdod in Philistia, which is of the same root as Shedad. Shedad plainly is a translation and not a corruption of the word Onam. For the connection of Shedad and Alvan I quote the authority of Hyde, who says that Shedad, the son of Aud, sent Dahak the Arab, the son of his brother Ulvanus, against Djemschid.[45] The historical statement is false, inasmuch as Djemschid was the son of this Dahak, if, as is most likely, he be Jachath son of Alvan, but the connection of Alvan and Onam as Shedad in the son of the former, is valuable. The Phœnician history of Sanchoniatho mentions a Sadid as a son of Ilus. Another representative of this family is Yaguth, who is Jachath, and he very properly is the supreme divinity of the Dhukailite Arabs,[46] the sons of Dhu-Calyan. Of the Adite line descended from Hobal, a prominent member is Lokman. He is Lubad or Gypt, *the vulture man*, and presents to us Achumai, Ahom or Achæmenes, with the prefix somewhat disguised of the Arabic article Al. The head of the Achæmenian Persians was said to have been nursed by an eagle or vulture, and Lokman is simply Al Achæmenes. Lubad is a form like Al Gypt, without the strong power of the cheth, rising from Ahumai rather than Achumai. He and his followers are reported to have been transformed into monkeys, the reverse of Mr. Darwin's hypothesis, and a tradition that we shall yet meet with in other lands.[47] To the above may be added Lud, the Arab, whose descendant Askelos founded the city of Ascalon, and who is undoubtedly the Lahad that gave to some of the Egyptians the name of Lud. He also is an Adite of Hobal. Among the kings of Egypt, whom the Arabs claim, are Kabus and his brother Al Walid. These may be Achumai and Lahad, the first in the form which we find in Cheops. Saba or Abd Shems (the servant of the sun), a very old Arabian king, I think may be Shobal, and his son Cahlan, Alvan,

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[45] Hyde, Religio Vet. Pers. 183.

[46] Banier, La Mythologie et les Fables expliquees par l'histoire, i. 528 seq. Kail or Cayl is a title of authority similar to Dhu, and is doubtless a form of (al or) Il, giving the full force of the initial ayin. The people of Khaulan who worship Il take their name from Alvan. The solar deity Dhu Kolosa is the lord of Elusa or Khulasa, the highest in heaven (Coelum) or Elysium. Eleusis is the same word.

[47] Sale's Koran, Preliminary Discourse. Lenormant and Chevalier, ii. 299.

especially as in Shobal we have the head of a pre-eminently solar line. A better acquaintance with the older Arabian historians would enable me to speak more decidedly upon this point.

Connected with the Arabian are the Talmudical legends. Some of these treat of Kabil, the head of the Deevs or demons. Kabil, as we shall yet see, is Shobal, associated in other mythologies with these same Deevs. The great enemy of the Deevs is Seth, not the son of Adam, but the Egyptian Sheth or Ashtar, whom we have already found at enmity with the Horite family.[48] The Chemosh of Moab is in all probability the Khem of Egypt and Cama of India, Achumai the son of Jachath.[49]

Persia.—Persia is the great Aryan land, an early name of which was Haroiou, the same word as Haroeh.[50] Its ancient history tells us that the first king who ruled in the earth after the great flood or destruction was Gil-shah or Kaiomers. He was called Abul-Muluk, or the father of kings.[51] This Gil or Gil-shah furnishes us with the name Il or Alvan, the full power of the initial ayin appearing in it; and he is the Abimelech who ruled in Gerar immediately after the destruction of the Cities of the Plain.[51*] Connected with him is Menoutchehr, the Egyptian Menes or Manahath the Horite, whose name on the monuments is Month-Hor. His son Nawder is a Neith-ra, and perhaps the Naater of the tablets. The Persian goddess Nahid is Neith or Nahath. We have already found that Djemschid or Achæmenes of the line of Gil-shah is Achumai. I have strong reasons, however, for making him the same as Kai Kobad, supposed to be a later Persian king, as I will yet show when treating of the Greek connections.[52] In Kai Kobad we have the Copt or Ægyptus already identified with Achumai. Lohurasp or Aurvadaçpa

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48 Baring Gould's Legends of Old Testament Characters, 67.

49 Sir Gardner Wilkinson, A Popular Account of the Ancient Egyptians, i. 286.

50 Rawlinson's Herodotus, App. Bk. i. Essay xi. s. 14.

51 Russell's Connection of Sacred and Profane History, ii. 28. London: Tegg.

51* Gilshah or Abimelech is probably the Abimelech of Abraham, who ruled in Gerar, his town, called after himself, being the Elusa of Ptolemy and others, now called by the Arabs El-Khulasa, thus shewing the power of the ayin. It is worthy of note that, although the name Elusa is not mentioned in the Bible, the Arabic version in Genesis xx. 1, 2, for Gerar reads El-Khulus, "as if referring it to Elusa." Robinson's Biblical Researches, i. 202. This is plainly the original of the Greek Eleusis, as well as of Elysium and Coelum, the Rarian plain near it being the region of Aroer, not far from Elusa. The first monarchy after the destruction of the Cities of the Plain was that of Gerar. The extensive and exceedingly ancient ruins in the neighbourhood of Elusa point to a far distant and high civilization.

52 Vide Shah Nameh for this and other particulars in Persian History.

is plainly a later Horus, who appears on the Egyptian monuments as a successor of Achumai. As for Feridun, he belongs to a different line, his ancestor Shah-Giliv being a Bible Caleb, the form of the Persian connecting with Æsculapius, and the Aiskulabita of the Book of Nabathean Agriculture.

India.—I am not by any means the first to connect Seb and Siva. Siva marries Iswara, and of him are Haru, Hari, and the seven mothers of the earth, the Harits. He is the great Deev like Kabil, and the seven Harits carry him. He is the sun, and also, like Seb and Hobal, Cronus, although this title is often given to his son Cala or Caliya, who is Il, Ilus or Alvan, with the full power of the initial ayin, and corresponds to the Persian Gilshah. The haunt of Siva and Caliya is Cailasa, which is Elusa or Khulasa in the Geraritic region of Palestine, over which Abimelech ruled. Vaivaswat, the son of Caliya, is not very like Jachath; nevertheless, I am persuaded that it is the same word, the Vivaghat of the Persian being identical, and merely requiring the prefix of the Coptic article with reduplication to complete it. Vaivaswat is still the sun, and is the father of Yama, whom numberless writers have identified with the Egyptian Ahom and the Persian Achæmenes.[53] Yama's domain is the south and dark region. Gopt is one of his attendants, or rather he, as Gopt, is an attendant of Siva. Siva himself is called Gopati, which is Coptus and Ægyptus. Siva's son is Cartikeya, but Pococke has found him in Kerkestes, son of Ægyptus.[54] A daughter of this line is Umes, in whom is represented the female name Ahmes, so common in Upper Egyptian records. She is Durga, but Durga is Zirah the hornet, for its second letter is ayin, hence Zirga. In the Æolic Greek the change of z to d is exceedingly common. A better connection still for the Zorathites of Shobal's line is found in the full name of an early Indian monarch, who appears in the Ramayana, Dasaratha, king of Oude, or of the Aud people. Zorathi and Dasaratha are the same, although I do not think that any Pharaoh bore this generic title. Lakshman and Rama are his sons, the former giving the Arab Lokman, and connecting with the monkey race that built the bridge of stones by which Rama passed to Ceylon from the mainland, just as Lokman is one of the monkey Adites. Rama at once recalls the Rameses who descended from Achumai.

[53] Guigniaut, ii. 116. Cama or Cupid the same as Khem; i. 297.
[54] India in Greece, 89.

Rama is himself an incarnation of Siva; and a later Parasurama, or Rama with the axe, is the Greek Perseus. The enemy of Siva or Mahadeva, the great Deev, is Mahiasura, the great Asura, in whom appears Ashcur or Usecheres, the father of Ashtari, Ashtar or Sheth. Another Indian story furnishes, in a somewhat disguised form, the names of several members of the Shobalian family. Shobal himself is Kapila, a form like the Talmudical Kabil. Kalyana and Roja, descended from him, are Alvan or Reaiah, and Mandhatu is plainly Manahath, while the unfortunate and wicked Chetiya represents the unhappy and cruel Jachath.[55] Menu, Manu Swayambhu, the fertile cow Sabala, and many other mythological characters, belong to the same Horite story. Different tribes have preserved the same narrative in different forms, both as regards fact and the orthography of proper names.

Asia Minor.—I have already claimed for the famous city of Ilium a connection with Ilus or Alvan, a connection favoured by Bishop Cumberland.[56] The Atys of Phrygia gives us, in his mournful story, a version of the history of Jahath or Jachath, called Ati upon the Egyptian monuments. He is a solar divinity like Jahath, is born of the stones cast behind them by Deucalion and Pyrrha (Dhu Calyan[56*] and Phre, a Ra or Rhea, with the prefix of the Coptic article), and is the first of the Galli, or priests of the Sun, a word which is simply a plural of the Gil form of Alvan's name. He is called Papas, and a striking coincidence appears in the fact that the Egyptian king is termed Ati or Pepi.[57] The Cappadocians, often thought to be the Caphtorim, are truly a family of Copts.[58] They were an unmixed people, fond of independence, and distinguished from others as the White Syrians. It is in Lydia, however, that we look for the Horite family. This country had intimate relations with Assyria and Palestine it is generally conceded,[59] but I can

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[55] Hardy's Manual of Buddhism, 134.

[56] Sanchoniatho's Phœn. Hist., 473.

[56*] The value of the k in Deukalion is at once known by the fact that the Irish Declan, who represents him, becomes the Welsh Dylan. The ayin of Alvan thus appears. Davies' British Druids, 104.

[57] On this all Egyptologists are agreed.

[58] Vide Gesenii Thesaurum.

[59] Anthon's Classical Dictionary, Art. Lydia. In my article on "The Coptic Element in Languages of the Indo-European Family," (*Canadian Journal*, Dec., 1872, p. 408), I have shown decided Arabian connections in the change of Aciamus and Atys to Alcimus (Lokman) and Alyattes, and in the presence of Sadyattes or Shedad in the Lydian dynasties.

prove a still more intimate connection with Egypt. A Lydian name of hoar antiquity is Sipylus or Shobal. The oldest king, however, whose name is recorded is Manes, who seems to reappear as the Maeon of Phrygia in the story of Atys. Manes is Menes and Manahath. His son is variously called Atys or Cotys. This is a mistake very likely to be made, Atys or Cotys being the nephew of Manahath, but ruling in Egypt as he did, while Alvan remained in Palestine. Atys or Cotys is Jachath. The sons of Atys are Lydus and Torybus. The former is Lahad. The latter is a word obscurely connecting with Achumai as the head of the Zorathites. We have a better name for him in the Aciamus, under whom Ascalus built Ascalon according to Lydian tradition.[60] Now Ascalus in the Arab story is a man of Ludim of Ad, and Lud is Lahad, the brother of Achumai. The relations of Moab and the line of Shobal we have already seen to be intimate, as Syria Sobal forms part of Moab, the image of the god Hobal came from that region, and Khem or Achumai is Chemosh, the Moabite god. But Mopsus, who is Moab, and Sipylus, who is Shobal, are represented as drowning Ichthys, the son of Atargatis, in a lake near Ascalon.[60] In Attis, Sabus and Minotaurus, so closely joined by Guigniaut, we find the three names Shobal, Manahath and Jahath.[61] Although not in Asia Minor, I may mention in this place the solar line of Colchis, including two forms of Jachath or the Egyptian Ati and Hekt. These are Aeetes and Hecate. The temple of Jupiter Actæus at Iolcos also commemorates Jachath.

Greece.—Among the islands, Crete is worthy of attention. There Minos is said to have ruled, and in him we see Menes and Manahath. The labyrinth agreeing with that of Mendes,[62] and the Minotaur, which is Mouth-Hor or the Persian Menoutchehr, confirm the identification. The Egyptian origin of Rhadamantus, the presence of Cherethites or Creti in the south of Palestine, and a town Minois near Gaza, are more than sufficient evidence of the transmission of the old Egyptian history to the island of the Mediterranean.[63] The names of Deucalion (Dhu Calyan) and Androgeus (Nawder or Naater) in the Cretan genealogies are also worthy of note.

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[60] Xanthus ap. Creuzeri Fragmenta.
[61] Guigniaut, ii. 944.
[62] Diod. Sic. i. 61, 66. Strab. xvii. 1, 42.
[63] Vide Hitzig, die Philistaer.

Of scarcely less importance than the history of Crete is that of Rhodes.[64] Its line is one of Heliads, a solar line. The sons of Helius, who is Ilus or Alvan, fled on account of a deluge, which reminds us of that of Gilshah, to other lands. Among them, Actis went to On or Heliopolis in Egypt, and taught the Egyptians astrology. Who can fail to recognise Jachath? Another is Ochime, whose name preserves more purely than any other the original form Achumai. His daughter Cydippe married Cercaphus, another Heliad, whom I have not yet been able to identify. From this union sprang Lindus, Jalyssus and Camirus, the equivalents of which I have not found. But in Cercaphus I recognise a head of the Cercopes, who infested Lydia in the time of Omphale, and whom Hercules changed into apes. Thus we have three traditions—the Arab, the Indian, and the Lydian forming about Achumai as a centre. The narrative of Diodorus Siculus takes some of the Heliades to Tabor in Palestine, although to him it is the Rhodian Atabyris. Ritter holds that Tabor is the original of the Rhodian name.[65] Some distance to the north of this mountain and westward on the sea-coast is Ecdippa, commemorating the name of Ochime's daughter, and close beside Ecdippa is Ummah, a memorial of himself. Cercaphus may survive in an Acrabbi (or Gecrabbi giving the force of the ayin) lying near Carmel, which at least one writer has identified with Camirus.

In Bœotia we meet with Actæon, the brother of a Hecate, who was torn to pieces by his dogs, just as Jachath or Achthoes was killed by his own guards, who should have defended him. His story is made a parallel to that of Atys, son of Crœsus, accidentally slain by his attendant.[66] In the same country, of which Thebes, a reminiscence of an Egyptian Thebes, was the capital, Sipylus (Shobal) and Minytus (Manahath) are numbered among the sons of Amphion and Niobe.[67] Amphion is the son of Epopeus (Apophis) and Antiope (Neith-pe), while Antiope is the daughter of Nycteus (Ma-Nachath). A form resembling Nycteus, in the absence of the initial M, is Antæus, whom Hercules slew in Egypt. Actæus, the ancient king of Attica, preceding Cecrops, probably Cercaphus, is Jachath or Achthoes, whose dominions, after the capture of On, would extend

[64] Diod. Sic. v. 55, seq.
[65] Die Vorhalle Europäischer Völkergeschichten 339, seq.
[66] Diod. Sic. iv. 81, seq.
[67] Apollodori, iii. 5, 6.

to Djebel Attaka. Echetus, the cruel king of Epirus, may be a memory of the same date, and the very word *Echthos, an enemy*, a generalization of the character of one whose early death cannot atone for his wickedness.[68]

It is, however, in the great family of the Dorians that we must find the ancestors of the Caphtorim and Zorathites. Their history begins with a deluge, the third which has come under our notice. This deluge I have good authority for placing on the borders of Egypt.[68*] It is that of Deucalion. I have already anticipated, by taking it for granted, that Deucalion is the Arab Dhu-calyan. He is Alvan, the Deev. A like name from a place in the same Palestinian region, the town of Nyssa, south of Gaza, is Dionysius, a Dhu-Nyssa. As Gilshah, we have found Deucalion ruling at Elusa, not far from the town which Diodorus connects with the Bacchic god.[69] Him, however, for the present we must dismiss. The wife of Deucalion is Pyrrha, the Rhea of Ilus, and a female Egyptian Phrah. The son of Deucalion is Hellen. Here we find the Dorian annalists guilty of multiplication like Manetho and his Egyptian predecessors, for Hellen and Deu-calion are one, the former replacing by a simple aspirate the hard initial sound of the latter, made necessary by the prefix Deu. Hellen is Alian, and the original Hellenes are the Alonim, a truly royal name. Of the sons of Hellen, we must dismiss Æolus. I know nothing certainly concerning him. Dorus and Xuthus remain. The former appears too early. The latter is Jachath. Dorus is another name for Achumai, answering in a measure to the Torybus, who is brother of Lydus. The Zorathites, in the form Zorah, furnish the Dorian name by the Æolic change of z to d. Of Apollo and Phthia, a purely Egyptian name, answering to Phthah, while Apollo is any solar personage, came Dorus and Laodocus, and these are the solar Achumai, the Zorathite, and Lahad, his brother. These answer to Lydus and Torybus of Atys or Cotys. The daughter of Dorus is Xanthippe, but the daughter of

[68] I have not given authorities for this Homeric and similar names with their connected legends, as they are accessible in any good classical dictionary, and a useless list of references would unnecessarily swell the size of the paper.

[68*] Hieronymi, Chronicon Eusebii. It is true that the deluge of Ogyges (Agag) is named instead of that of Deucalion, but it is plain that they are one, for Ogyges is the founder of Eleusis, which is Elusa in Gerar. Africanus, in the third Book of his Chronicle, quoted by Syncellus, seems to speak of Ogyges and Actaeus as if one person. Now, Actaeus is Jachath, son of Alvan or Deucalion.

[69] Diod. Sic. iv. 2.

the Persian Kai Kobad, who is also Achumai, is Sendabeh, and the daughter of Ochime is Cydippe. It is utterly impossible that this can be mere coincidence. A son of Dorus is Teutamas, and Tothmosis is a successor of Ahmes or Achumai. The mythic ancestors of the Dorians is Ægimius, and in him we again find Achumai appearing. Dymas, the son of Ægimius, is but a shortened form of Teutamas of Dorus, and Tothmosis of Ahmes. Herodotus rightly brings the Dorians from Egypt. Mazocchi correctly traces them to Dor and Endor and similar towns south of Carmel.[70] Their cities are the same as those of the Heliads of Rhodes, for Helius is Hellen, Actis Xuthus, and Ochime Ægimius or Dorus. Epidaurus is a later form of Caphtor. I have said that I know nothing of the Æolians. Their story connects intimately with that of the Dorians, and it may be that Æolus is also Alvan. Sisyphus is certainly his brother Shepho, Œbalus is Ebal, and Œnomaus Onam. Time will not permit me to show the extent of my researches in connection with them.

Illyria may here engage our attention, as lying between Greece and Italy. I should never have been induced, had not other evidence led me to it, to divide this word into the two constituents Il and Ra, although this combination is justified by the Chaldæan equivalent of Alvan, Alorus.[71] The Eneti, or descendants of Anah, we have already seen to be an Illyrian people. In Illyria were also found Oreitæ (Horites), and Dassaritæ (Zorathites), a name which at once calls to remembrance the Indian Dasaratha. The modern, as well as the ancient, Albanians are the people of Alvan, and their other name Skipetar, as well as their town Epidaurus, represent their old home in Kebt-Hor and their Bible name Caphtorim. A glance at Illyrian geography will furnish abundant evidence of the Horite ancestry of the brave Albanians.

Italy.—Hyde has already, in the Arabic Sambula, provided a common ground on which Sybil and Spica, the Hebrew Shobal and the Egyptian Sebek, may meet. The Sabine god Sabus, and the whole Sabellian family unite in this connection. The Rhodian Helius becomes the Latin Sol, and the Hebrew Alvan the Latin Silvanus, by the same rule. Silvanus, the enemy of children, is the cruel Ilus

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[70] Vide note 37. Dora was probably the most southern of the Phœnician towns. Its inhabitants were never subdued. Stephanus of Byzantium calls its founder Dorus, son of Neptune. —Smith's Dictionary of the Bible.

[71] Berosus, Cory's Ancient Fragments.. Galloway, E. R., 162.

or Cronus, who is represented as sacrificing his son. The Silenes, named after him, are a monkey race, once more reproducing the Arab, Indian and Lydian stories. Rhea Silvia or Ilia is the old Rhea, wife of Ilus, the Pyrrha that married Deucalion, and that bears both the names of the eldest son of Shobal. The Etruscan Mantus is Manahath. Apollo and Apulia represent Ebal. Coelus and Elysium are the abode of Shobal, the great Deev, and his son Alvan, or Gilshah, or Caliya, in Elusa or Khulasa, the Cailasa of the Hindoos. Of Coelus and Hecate, a strange combination, seeing that they are the names of father and son, Janus is said to be the offspring. But Janus, the fish-god, is Oannes or Onam, a prominent member of the Horite family. The line of Alba, the white city, is peculiarly Horite. In it we find Latinus, who is Lotan. Alba Sylvius is Alvan himself, twice named over. His son Atys is Jahath, and, strange to say, is also called Capetus, while his son is Capys, thus twice reproducing the Ægyptus, Kobad or Cheops, whom we have found to be Achumai. Thus plainly did the old story of a far-off and bygone civilization live in the memories of those who claimed as their ancestors the children of Seir, the Horite.[72]

Germans and Celts.—The German and Scandinavian mythologies have few points of connection with the Horites. Their gods and heroes belong principally to two other families, those of Etam and Ashchur. The red Shethites are among the ancestors of these peoples. Still Ra or Il survives in the god Frey with his wife

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[72] The following table presents the names, which, generally in genealogical order, recall the principal family of the line of Shobal:

Horite.	Shobal.	Alvan, Alian. *Roch, Reaiah.*	Jachath.	Achumai.
Egyptian.	Seb.	*Ra.*	Achthoes, Ati or *Pepi.*	Ahom, Kames. *Cheops, Ægyptus.*
Phœnician.	——	Elioun, Ilus.	Jehid.	?Coum.
Arabian.	Hobal.	Il, Ulvanus. Dhucalyan.	Yaguth.	Lokman. *Kabus.*
Persian.	——	Gil-shah.	?Zohak.	Achæmenes. *Kai Kobad.*
Indian.	Kapila. Siva.	Cala, Kalyana. *Roja.*	Vaivaswat. Chetiya.	Yama. *Gopati.*
Lydian.	Sipylus.	——	Atys or Cotys. *Papas.*	Aciamus. Alcimus.
Rhodian.	——	Helius.	Actis.	Ochime.
Dorian.	——	Hellen. Deucalion.	Xuthus.	Ægimius.
Alban.	——	Alba Sylvius.	Atys or *Capetus.*	*Capys.*

Freya, the Egyptian Phre, and as Il in the annual feast which was held in his honour, called Yule.[73] Ondurdis also is the Egyptian Onderah or Denderah, which takes its name from the god and first ruler of Heliopolis. The Celtic divinity, Ogmius, with his Mercury and Hercules associations, has been frequently identified with Ahom, and is Achumai. The Irish Ogomuin, son of Thoi, must be the same, Thoi being a form of Jahath, an Achthoes without the first syllable. He seems to be represented by the British Beli, who is called erroneously son of Manhogan (Manachath), and correctly the father of Llud (Lahad). Beli may be the name of Alvan himself, given to Jachath when accurate history perished, and a tendency arose to reduce the solar divinities to unity.

The Ethiopian deity Assabinus, and its earliest monarch Arwe, may be Eshban and Haroeh. Manachath may appear not only in the Chinese Ming-ti but also in the Peruvian Manco-Guina-Capac and the Algonquin Manitou. It would be strange if the ancient people of China and the tribes of this continent could be shown to have dwelt within the influence of a Horite civilization. The unity and recent origin of the human race would be at once established could this be done, as I doubt not it will be before long. In the meantime, the various traditions of civilized peoples have carried us back to the days of Abraham and to the lands in which he sojourned—Palestine, Egypt, and the region lying between; and pointed these out as the time and the place when and where man, a second time beginning to fill the earth, laid the foundations of his present prosperity. The facts I have given, through the connections established between the Scripture narrative and tradition, are a besom to sweep into the waste-basket of literature the utterly unfounded hypotheses of Bunsen and others, which throw the commencement of Egyptian history thousands of years into the past. They abolish, I trust for ever, that absurd class of interpreters of mythology, who make Euhemerus a continual object of scorn, and pleasingly imagine a world sitting down in its various divisions to weave out of its own brain a complex and unintelligible solar allegory. They say to the ethnologist, the student of language, the comparative geographer, the groper towards a science of religions, the historian, as they point to the eastern life of nearly four thousand years ago—there is the long-forgotten field in which your studies must begin if they are to be

[73] Mallet's Northern Antiquities. Bohn; 110.

successful. And, more important than all, they tell the Gentile of a Divine hand, not simply leading him as well as the Jew through the early period of the world's history, but placing on record, briefly as becomes the littleness of things human in view of the Divine, yet comprehensively, the roll of his forgotten ancestry. Spite of all questions regarding the books of Chronicles, the Bible still proves itself the true and faithful Word, the great standard of historic fact as well as of spiritual truth and life. I am fully conscious of the importance of the revolution which the acceptance of the truths set forth in this paper will cause in the world of historical science. Of this, however, I am also sure—

"Magna est veritas et prævalebit."

NOTES ON STATICS.

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The following notes are in continuation of what was published in the *Canadian Journal* for February, 1872. All these proofs were devised by the writer during the year 1868, but were not communicated to the Canadian Institute until November, 1870.

7. On transferring the origin from O to a point O' at a distance r on OA, we will have there R, G, and $Rr \sin \theta$, the axis of the latter being parallel to OD, perpendicular to the plane ROA. The axis of the resultant couple G' at O' is therefore in a plane parallel to DOC, and the plane of G' must therefore meet the plane of G along a line parallel to OB.

8. If OC be perpendicular to DOA, the plane of G' will intersect ROA along OA, in which case the reciprocal lines will coincide or be parallel.

9. To find the moment centre of a plane passing through a given line. Let the plane be the plane of the paper, OA the given line, R, G, the force and couple at O; α the angle which the axis of G makes with the given plane; OF in the given plane perpendicular to the axis of G; OD perpendicular to ROF; γ the angle ROF; δ the angle between OD and the given plane.

Then on transferring to O' at a distance r in OF, we have there R, G, and $Rr \sin \gamma$, the axis of the latter being parallel to the plane GOD. Therefore the axis of G', the Resultant of G and $Rr \sin \gamma$, will be perpendicular to the given plane if

$$G \cos \alpha = Rr \sin \gamma \cos \delta,$$

$$\text{or } r = \frac{G \cos \alpha}{R \sin \gamma \cos \delta},$$

which determines the position of O', the moment-centre of the given plane.

10. The angle between OA and its reciprocal is plainly $\frac{\pi}{2} - \phi$. The lines are therefore perpendicular to each other when $\phi = 0$, which requires OA to be coincident with OC, and therefore

$$\cos \beta = \cos \theta \cos \alpha.$$

In this case, calling the forces F_1 and F_2, we have

$$F_1 = R\cos\theta,\ F_2 = R\sin\theta,$$
$$p = \frac{2G\cos\beta}{R\sin 2\theta}.$$

Now p is least when $\sin 2\theta$ is greatest, $\frac{G\cos\beta}{R}$ being constant, that is, when $\theta = \frac{\pi}{4}$, in which case,

$$F_1 = F_2 = \frac{R}{\sqrt{2}},$$
$$\text{and } p = \frac{2G\cos\beta}{R}.$$

11. Let F_1 and F_2 denote generally the forces which act along the reciprocal lines; then the volume of the tetrahedron of which these lines are opposite edges

$$= \tfrac{1}{6} F_1 F_2 p \sin\left(\frac{\pi}{2} - \psi\right)$$
$$= \tfrac{1}{6}\frac{R\cos(\theta-\psi)}{\cos\psi}\cdot\frac{R\sin\theta}{\cos\psi}\cdot\frac{G\cos\phi}{R\sin\theta}\cdot\cos\psi$$
$$= \tfrac{1}{6} RG\ \frac{\cos(\theta-\psi)\cos\phi}{\cos\psi}$$
$$= \tfrac{1}{6} RG\cos\beta$$

since $\dfrac{\cos\beta}{\cos(\theta-\psi)} = \dfrac{\cos\phi}{\cos\psi}$.

And $\frac{1}{6} RG\cos\beta$ is constant. Wherefore, &c.

12. To find the relative positions of the reciprocal lines and the central axis.

Let LM, $L'N$ be the projections of the reciprocal of OA and the central axis on the plane ROA (figure of § 4); OM, ON the respective perpendiculars on these from O.

Then $OL = \dfrac{OM}{\cos\psi} = \dfrac{s\sin\alpha}{\cos\psi} = \dfrac{G\cos\psi\sin\alpha}{R\sin\theta\cos\psi} = \dfrac{G\sin\alpha}{R\sin\theta}$.

Also $OL' = \dfrac{ON}{\sin\theta} = \dfrac{\rho\sin\lambda}{\sin\theta} = \dfrac{G\sin\beta\sin\lambda}{R\sin\theta} = \dfrac{G\sin\alpha}{R\sin\theta}$,

where ρ is the distance of the central axis from O, and λ the angle between the planes ROG, ROA.

The projections of the central axis and the reciprocal of OA pass, therefore, through the same point L at a distance from O equal to

$$\frac{G\sin\alpha}{R\sin\theta}.$$

13. If p' denote the perpendicular distance between OA and the central axis, we have

$$p = \frac{G \cos \phi}{R \sin \theta},$$

$$p' = \frac{G \sin \beta \cos \lambda}{R} = p - \frac{G \cos \beta \cot \theta}{R}.$$

Therefore $(p - p') \tan \theta = \frac{G \cos \beta}{R}$, which is constant.

14. To reduce the Resultant force R, and the Resultant couple K, the origin being on the central axis, to two forces one of which shall act along a given line.

Let the given line be in the plane of the paper at a distance p_1 from and making an angle θ_1 with the central axis which may be supposed parallel to the plane of the paper.

Resolve R into Q, $R-Q$, at distances p_1, $\frac{p_1 Q}{R-Q}$, respectively, from the central axis; and let the forces of K be each equal to $\frac{R-Q}{p_1 R} K$ at a distance $\frac{p_1 R}{R-Q}$ apart. Then taking one of the forces of the couple to act with Q, and the other with $R-Q$, we have

$$F_1^2 = Q^2 + \left(\frac{R-Q}{p_1 R} \cdot K\right)^2,$$

$$F_2^2 = (R-Q)^2 + \left(\frac{R-Q}{p_1 R} \cdot K\right)^2,$$

$$\tan \theta_1 = \frac{R-Q}{p_1 R} \cdot \frac{K}{R},$$

$$\tan \theta_2 = \frac{K}{p_1 R},$$

where θ_2 is the angle which F_2 makes with the central axis. From these we find

$$F_1 = \frac{KR \sec \theta_1}{K + p_1 R \tan \theta_1},$$

$$F_2 = \frac{R \tan \theta_1}{K + p_1 R \tan \theta_1} (K_2 + p_1^2 R^2)^{\frac{1}{2}},$$

$$\tan \psi' = \frac{K + p_1 R \tan \theta_1}{p_1 R - K \tan \theta_1},$$

since ψ', the angle between F_1 and F_2, is equal to $\theta_1 + \theta_2$.

15. The formulas of §13 follow immediately from those of the preceding section, as does also the property proved in § 11. Thus six times the volume of the tetrahedron

$$
\begin{aligned}
&= F_1 F_2 (p_1 + p_2) \sin \psi' \\
&= F_1 F_2 (p_1 + p_2) (\sin \theta_1 \cos \theta_2 + \cos \theta_3 \sin \theta_2) \\
&= F_1 F_2 (p_1 + p_2) \left(\frac{S}{F_1} \cdot \frac{R-Q}{F_2} + \frac{Q}{F_1} \cdot \frac{S}{F_2} \right) \\
&= (p_1 + p_2) (R-Q+Q) S \\
&= KR,
\end{aligned}
$$

where $S = \dfrac{R-Q}{p_1 R} K$.

16. The principle of Virtual Velocities.

Lemma. The most general displacement of a body can be effected by supposing it to move along and around a certain straight line.

Suppose that a body is at rest under the action of the forces $P_1, P_2, P_3, \ldots P_n$ at the points $A_1, A_2, \ldots A_n$, and that the forces make angles $\theta_1, \theta_2, \theta_3, \ldots \theta_n$ with the above line; then the sum of their components parallel to this line vanishes, as does also the sum of their moments around it.

(i). Let the displacement be along the line through the distance $A_1 B_1 = A_2 B_2 = \ldots = \delta r$; then

$$
\begin{aligned}
&\Sigma (P \cos \theta) = 0, \\
&\Sigma (P \delta r \cos \theta) = 0, \\
\text{or } &\Sigma (P \delta p) = 0 \ldots\ldots (1),
\end{aligned}
$$

where δp_1 is the projection of δr on the direction of P_1, &c.

(ii). Let the displacement be around the line through the angle δa, so that P_1 now acts parallel to its former direction at C_1, where $B_1 C_1 = \delta s_1 = a_1 \delta a$, if a_1 denote the distance of B_1 from the central axis. Also let φ_1 be the angle between a_1 and p_1, the distance of the component $P_1 \sin \theta_1$ at B_1 from the central axis. Then

$$
\begin{aligned}
&\Sigma (Pp \sin \theta) = 0, \\
&\Sigma (Pa \cos \phi \sin \theta) = 0, \\
&\frac{1}{da} \Sigma (P \delta s \cos \phi \sin \theta) = 0, \\
&\Sigma (P \delta s \cos \phi \sin \theta) = 0.
\end{aligned}
$$

But $\cos \varphi_1 \sin \theta_1 = \cos \psi_1$, if ψ_1 be the angle between $B_1 C_1$ and the direction of P_1; therefore

$$
\begin{aligned}
&\Sigma (P \delta s \cos \psi) = 0, \\
\text{or } &\Sigma (P \delta p') = 0 \ldots\ldots (2).
\end{aligned}
$$

where $\delta p_1'$ is the projection of B_1C_1 on the direction of P_1. But if $\delta\sigma_1$ denote the projection of A_1C_1 on the direction of P_1, we have

$$\delta\sigma = \delta p + \delta p'.$$

Therefore from (1) and (2) we have

$$\Sigma\,(P\,\delta\sigma) = 0,$$

the general equation which expresses the principle.

17. When there is a system of bodies at rest under the forces $(P_1, P_2, \ldots.)$, $(Q_1, Q_2, \ldots.)$, &c, and the mutual actions between the bodies, then supposing the whole system as such to receive the most general infinitesimal displacement, it follows that

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) + \ldots\ldots = 0,$$

in which equation the virtual moments of the mutual actions between the bodies have disappeared.

18. If one body only of the system is displaced, then

$$\Sigma\,(P\,\delta p) = 0$$

in which equation the virtual moments of the various reactions of the other bodies on it will appear.

19. If two bodies only be displaced around and along the same line, then

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) = 0,$$

in which equation the virtual moments of the mutual actions of the two bodies only have disappeared.

20. If all the bodies receive displacements around and along different lines, the virtual moments of the mutual actions appear in each of the equations

$$\Sigma\,(P\,\delta p) = 0,\ \Sigma\,(Q\,\delta q) = 0,\ \&c.,$$

and also in

$$\Sigma\,(P\,\delta p) + \Sigma\,(Q\,\delta q) + \ldots\ldots = 0.$$

ON THE

HABITS OF A SMALL SNAKE IN CAPTIVITY.

BY E. J. CHAPMAN, PH.D,

Professor of Mineralogy and Geology in University College, Toronto.

Our knowledge of the anatomy of Reptiles, so far at least as regards living types, leaves probably little to be desired; but a wide field of research is still open to our study of the ways of life and mental characteristics, so to say, of these creatures. The following notes, on the habits of a small snake in captivity, are offered as a slight contribution to this study. Captive animals live necessarily to some extent under abnormal conditions; but this, although rendering our observation of their habits more or less incomplete, is not without certain advantages. It affords a test, for example, of the creature's powers of adaptation to change; and it serves to develop or reveal traits of character to which instinct can in no respect lay claim.

The subject of my memoir was captured, I believe, on the grassy slope in the immediate vicinity of our University Buildings, but it came into my possession as follows:—On entering my lecture-room one afternoon in October 1871, I thought that the attention of the students was fixed in a somewhat remarkable manner on the table before me; and this was soon explained by a rustling noise beneath some drawings lying loosely there, followed by the emergence from among these of a small snake—the little creature turning rapidly about, seemingly bewildered by its novel situation, and by the unrestrained burst of applause with which its appearance was greeted. Seeing that it belonged to a well-known harmless species, I covered it with a chemical beaker-glass that happened to be at hand, and so kept it imprisoned until the lecture was finished. I then put it into a small bottle with the intention of liberating it in the Park on my way home, but forgot to do so: in fact, it remained in its close quarters in the pocket of my coat until the next morning. The idea then occurred to me to keep it for a short time in order to observe its habits. I prepared a sufficiently roomy dwelling for it, by attaching

two wide-mouthed bottles together by a perforated cork : placing in one of the bottles a handful of damp grass, and a little water in the other—the two resting habitually on their sides. The little snake could thus travel at will from one to the other through the perforated cork.

My captive belonged to the common Canadian species known familiarly as the "little brown snake," originally regarded, and I think correctly so, as a variety of *coluber ordinatus*. This species has been referred, however, of late years, to Kuhl's genus *Tropidonotus*, under the name of *T. Dekayi*. The genus *Tropidonotus* is made to include the colubers which habitually resort to the water, and which have two plates above the eye-orbit, in place of a single plate as in the colubers proper. The aquatic tendency in snakes, I imagine, is a very indefinite character, as there are probably few of these creatures that do not take to the water more or less readily in pursuit of prey. I have frequently seen both our little "grass snake," *Coluber vernalis*, and the small "ringed snake," *C. punctatus*, swimming freely in streams and pools in the woods ; and some years ago, at the northern extremity of Lake Couchiching, I killed with a canoe-paddle a young rattlesnake that was swimming boldly nearly half a mile from the shore. The men at the Severn Mills to whom I shewed my booty, and who had several large snakes nailed to one of the doors of the mill, assured me that the rattlesnakes there commonly took to the water when pursued. Leaving, however, the question of generic identity, I may mention that the "little brown snake" is distinguished more especially by the following characters : The colour above is ash-brown, with a broad band of somewhat lighter tint running along the dorsal ridge, and a row of small dark flecks or spots upon the sides. On the ventral surface, the colour is very pale brown, and each large ventral plate bears a minute black dot upon the sides. The head is small, flattened horizontally, and protected above by ten plates, three of which are almost black ; and a black band runs obliquely across each side of the head, and another passes transversely across the neck. The dorsal and lateral scales are strongly carinated. The ventral scales below the anal orifice form a double row, as in all the Colubers, and the tail tapers to a point of extreme fineness. Fang teeth are altogether wanting. This species frequents the same haunts as the beautiful little grass snake, *C. vernalis*, and much resembles it in general form and size ; but the grass snake has smooth scales, and it

is of course at once distinguished by its delicate bluish-green colour. I have often seen the two crossing each other's paths without exhibiting any hostile propensities, although the grass snake is said to fight desperately at times with the ringed snake and other small species.

My little captive appeared to accommodate itself to its prison very readily. It would lie coiled up and almost invisible among the grass, or hang suspended from some of the grassy stalks, during many consecutive hours, and would then become for a time exceedingly active, twisting itself very rapidly through the stalks, and gliding backwards and forwards from one end of the bottle to the other. It very rarely left its grassy cover, however, and entered the empty bottle; but now and then it did so. When hanging motionless, and especially during pauses in its perambulations, it kept up a constant protrusion and withdrawal of its forked tongue. As a rule, the tongue was darted straight out, and was then drawn back with two or three rapid lateral vibrations, and this movement was sometimes maintained for hours together. The little creature never seemed to exhibit any fear, but it evidently tried to conceal itself at times among the grass; and when I first had it, I thought occasionally that some one must have opened the bottle during my absence, and let the creature escape, as I frequently looked for it without detecting its presence for several minutes, so closely did its body resemble the half withered grass and stalks amongst which it had twisted itself. To some extent also, I am sure, there was a slight adaptation in colour to the objects in contact with different portions of its skin, more especially when the sun was shining strongly upon it. During the entire winter it never exhibited the slightest disposition to hybernate, although the bottle on several occasions was exposed accidentally to a very low temperature.

I tried it with all kinds of food, but during the seven months that it remained in my possession, I never saw it eat the slightest particle. It took not the slightest notice of flies, spiders, and other insects; and I have seen a large fly settle on the outer cornea of one of its eyes, and remain there for some minutes, apparently unobserved. It drank, however, constantly, scooping up the water, and then raising its head to swallow, exactly in the manner of a bird—the tongue taking no part in the operation. Milk it would not touch; and on one occasion when I placed a drop of honey on its snout, it shewed signs of irritation, and rubbed off the honey immediately against the grass and the sides of the bottle.

On several occasions I placed it in a large flat dish filled with water, but it always made desperate attempts to get out, although swimming with great facility; and if a piece of stone were placed in the dish, it would crawl on to it in a moment. I have seen these snakes, when free, swimming rapidly in small streams and pools, but probably they only take to the water in quest of aquatic larvæ and other prey. Whilst it was swimming in the dish, I could not detect the slightest change in the cylindrical form of its body, although a lateral flattening is said to take place in species of the genus Tropidonotus during natation, by the peculiar mobility of the ribs.

After the lapse of three or four weeks, I opened the bottles almost every evening and allowed the little snake to have a walk upon the table, a row of books in upright position being placed around this to prevent the snake from escaping. It could easily, no doubt, have climbed over this barrier. It never did so, however, but kept travelling round and round against the sides of the books, and very rarely ventured across the open table. I frequently placed my hand in its path and let the creature glide over it, when the part played by the ventral scales in assisting the animal's progression became very perceptible. This is felt more especially if the thin skin of the back of the hand be exposed to the action of these ventral plates.

After the animal had been allowed, as described above, to take its first walk upon the table, it tried to avoid re-entering its nest, and constantly turned aside from the open mouths of the bottles placed before it. On my attempting to guide it into one of these by means of a long pen-holder that I happened to have in my hand, the creature became defiant—raising its head and arched neck above the table, and opening its mouth to the widest extent. Two or three smart taps upon its head, however, soon caused its courage to collapse, and in a moment it beat a retreat and darted into its bottle to hide itself amongst the grass. A somewhat similar skirmish ensued on the two or three succeeding evenings, when the time for retiring had arrived; but after that, it never attempted resistance; and whenever I wished to make the creature re-enter its bottle, I had only to rap sharply on the table, or pretend to strike at it with the pen-holder, to make it immediately betake itself to its grassy hiding-place. On witnessing this, night after night, I could well understand the asserted teachableness of the Indian snakes of which so many curious anecdotes are related. I had also another proof of its intelligence. During the

day, as a rule, the bottles in which it lived were put aside on a shelf in a warm part of my work-room, and were never opened. But, with only an occasional exception, the creature was let out for a short time every evening. In the morning it generally kept itself concealed amongst the grass; but regularly, night after night, I found it close to the united necks of the bottles, and often lying indeed partly within the perforated cork, ready to dart out as soon as the bottles were taken apart. This was, I think, too constantly repeated to be the effect of mere accident.

My chief object in keeping this little snake was to see it cast its skin; but as the creature continued active throughout the entire winter, and took, apparently, no food, I began at last to fear that in this respect I should be disappointed. Finally, however, when nearly seven months had elapsed from the date of the animal's capture, my wish was gratified. The mode by which the operation of getting rid of the old skin was effected, differed in one essential respect from that described by Professor Owen in his very elaborate work on the "Anatomy of the Vertebrates." In this work (vol. i., p. 553), the process is thus described:

"In serpents, the epiderm is shed, usually entire, and the animal, partially blindfolded by the opacity of the layer passing over the cornea, seeks an obscure retreat; but I have watched the process of exuviation in a captive snake. It rubs the front and sides of the mouth against its prison wall, thus detaching and reflecting the cuticle from the oral margin, until it is turned back from over the whole head: the snake then brings forward its tail and coils it transversely round the head, and by pushing the head through the coil turns the cuticle back upon the neck; then tightening the coil and renewing the forward movement, threading the body, as it were, through the caudal ring, the cuticle is pushed further and further back, until the eversion has been carried so near the end of the tail as prevents the further action of the coil; the animal finally glides along, dragging behind the whole of the loosened epiderm, and a few wriggling actions of the tail serve to completely detach it."

In my captive's case, the operation was somewhat less artistically performed. Shortly before the close of April, I noticed that the animal appeared to be sickening, and seemed disinclined to come out of the grass. A day or two after, I observed a ridge of dry skin raised around the margin of the snout; and in the course of a few

hours the skin all over the fore part of the head was gradually loosened and lifted, but nothing more occurred that day. Early the next morning, on examining the bottle, I found the snake had evidently twisted or matted together some of the stouter stalks and fibres of the grass so as to form a kind of narrow loop, within which it was then hanging with nearly half the skin pushed back from its body. At short intervals, the tongue in rapid vibration all the while, the creature urged itself further and further within the loop, and in this manner the skin was gradually forced back, until finally it came away altogether, a small portion of the extreme end of the finely-pointed tail coming off with it. On getting quite free, the creature drank very eagerly four or five times, and then retired among the grass and kept quiet, but was ready for its accustomed walk the same evening.

I waited now only for the coming of the warm days to take my captive to the fields and set it free. But it was doomed to die in its captivity. One evening whilst the snake was taking its usual promenade, a young cat, to which I had given shelter on a bitter winter night, and which afterwards remained on sufferance about the place, stole into the room unobserved and sprang suddenly upon the table. I was standing at the time a few paces off, and I had in my hand a somewhat bulky but unbound book. I made pretence to hurl this at the cat, when the book flew from my hand and struck the unfortunate snake, inflicting upon it a long and terrible wound, from which its entrails protruded. Seeing that the hurt was beyond remedy, I put the creature out of its pain by killing it at once: and thus our seven months' companionship was brought abruptly to an end.

CANADIAN INSTITUTE.

ANNUAL REPORT OF THE COUNCIL FOR THE YEAR 1871–72.

The Council of the Canadian Institute have the honor to present the following Report of the proceedings of the Society for the past year, from 1st December 1871, to the 30th November, 2872.

MEMBERSHIP.

The present state of Membership:

Members at commencement of Session, 1st December, 1871	332
Members elected during Session, 1871–72	12
Deduct.	
Deaths during the year 1872	4
Withdrawn	6
Total 30th November, 1872	334
Composed of	
Honorary Members	5
Life Members	20
Corresponding Members	5
Ordinary Members	304
Total	334

COMMUNICATIONS.

The following valuable and instructive papers and communications were read and received at the ordinary meetings held during the Session:

2nd December, 1871.—The President, "Short Sketch of the late Prof. Hincks."

2nd December, 1871.—Dr. Wilson, "A Pre-Darwinian Type of the missing link between Man and the Anthropoids."

9th December, 1871.—Dr. Canniff, "On the relation of Air germs to Suppuration."

9th December, 1871.—Dr. Nicholson, "Remarks on the action of Carbolic Acid in checking Suppuration."

9th December, 1871.—Mr. Watson exhibited a portion of an Aerolite found in Glengary in April last; and read a paper relating the circumstances of its discovery, and embodying some information relative to the subject of Meteoric Stones.

16th December, 1871.—The Annual Report.

16th December, 1871.—Dr. Nicholson, "Geological Continuity."

16th December, 1871.—The President laid on the table a two-franc piece, of the République Française, 1870, and some other coins illustrative of the vicissitudes of French History, and read a brief paper on the collection.

13th January, 1872.—The President's Annual Address, being a paper entitled "Toronto before the Conquest (1760) and after."

20th January, 1872.—Mr. A. Elvins, "On the connection between Sun-spots and the Rain-fall."

3rd February, 1872.—Prof. Kingston, "On the recent progress of Meteorological research in Canada;" and the President read a communication from the Rev. Mr. Dade, on "Lunar Influences."

10th February, 1872.—The Rev. J. Campbell, M.A., "The Coptic Element in the Indo-European Family of Languages."

17*th February*, 1872.—Prof. Nicholson, "Defects of the Geological Record."
24*th February*, 1872.—Dr. Reeve, "The Eye in health and disease."
2*nd March*, 1872.—Dr. Wilson, "Prof. Huxley's new Rules for Classification in Anthropology."
9*th March*, 1872.—The President, "Notice of Lahontan."
16*th March*, 1872.—Prof. Buckland, "Arboriculture in Canada."
23*rd March*, 1872.—Dr. McCaul, "The Trades of Ancient Italy."
23*rd March*, 1872.—Dr. Warren exhibited several relics of the Franco-Prussian war, accompanied with observations.
6*th April*, 1872.—The President read a communication on "Lunar Influences, from forty years' observation in Ontario," by the Rev. Mr. Dade.
13*th April*, 1872.—Prof. Chapman, "On some popular fallacies respecting certain Gold bearing Ores, Iron Ores, and Phosphate deposits, as occurring in Canada." And the President read a communication from the Rev. Mr. McNish, upon "The Authenticity of Ossian's Poems."
13*th April*, 1872.—Dr. Wilson made some observations on the Muskoka region, accompanied by a number of Sketches of the Scenery, taken by himself.

THE TREASURER IN ACCOUNT WITH THE CANADIAN INSTITUTE.

Debtor.

To Balance from last year		$339 39
To Cash received from 45 Members for subscriptions		233 00
" Journals sold		4 00
" Rents, $45; Commission, $2 10		39 90
" Government allowance		750 00
" Dividend Stock, April	$135 00	
" " " October	135 00	
		270 00
		$1,636 29

Creditor.

By Cash paid Insurance, Western, $5,000			$75 00		
" " Royal, $1,800			22 50		
					97 50
" Myles for Firewood					7 00
" Petty Expenses—					
	Institute.	Library.	Journal.		
	$6 06	$4 59			
	18 73				
	9 29	1 10	2 63		
	4 81	0 43			
	7 87	0 16	0 65		
	8 02	0 43			
	19 00		137 78		
	51 15				
	4 66	4 53	2 72		
	8 47	1 05	0 12		
	14 00		181 34		
	$152 06	$13 82	$323 71		
			13 82		
			152 06		
					489 59
Carried forward					$594 09

Brought forward	$594 09
By Cash paid Assistant Secretary's salary—January, April, July and October, $84 each	336 00
" Bain's account for Periodicals	15 00
" Allowance to Mrs. Galbraith	10 00
" Building Fund	102 16
By Balance carried forward	579 04
	$1,636 29

SAMUEL SPREULL,
Toronto, 20th December, 1872. *Treasurer.*

The undersigned Auditors have compared the vouchers for the items of these accounts with the cash book, and find them to agree. The balance in hands of the Treasurer is $579 04.

W. J. McDONELL.
A. M. ROSEBURGH.

APPENDIX.

DONATIONS OF BOOKS,

RECEIVED SINCE LAST ANNUAL REPORT, 30TH NOVEMBER, 1871.

1.—Journal Royal Geographical Society, Vol. 40, 1870 1
2.—Proceedings of Royal Geographical Society, Vol. 14, No. 5; Vol. 15, Nos. 1, 2, 3, 4; 1871 5
3.—Quarterly Journal of the Geological Society, Vol. 26, Part 4, Nov. 1st, 1870, No. 104 1
Vol. 27, Part 1, Feb. 1st, 1871, No. 105 1
Vol. 27, Part 2, May 1st, 1871, No. 106 1
Vol. 27, Part 3, August 1st, 1871, No. 107 1
4.—Journal of the Royal Asiatic Society of Great Britain and Ireland (New Series), Vol. 5, Part 1 1

Per H. Rowsell, Esq —From Major-General Lefroy, R.A.—

5.—On a Bronze Object, bearing a Runic Inscription, found at Green Mount, Castle Bellingham, County Louth, from the Society.
6.—Proceedings of the Literary and Philosophical Society, Liverpool—
No. 23, Sessions 1868–9 1
No. 24, Sessions 1869–70 1
7.—Resumen de las Observaciones Meteorologicas, Madrid—
December, 1866; November, 1867 1
December, 1867; November, 1868 1
Observaciones Meteorologicas de Madrid—
December, 1867; November, 1868 1
Anuario del Observation de Madrid, Ano 9, December, 1869 1
Anuario del Observation de Madrid, Ano 10, December, 1870 1
8.—Pamphlets from the Societies, per Smithsonian Institution—
Proceedings of the Geological and Polytechnical Society of West Ridiug of Yorkshire 1
List of Members 1

Proceedings of the Philosophical Society of Glasgow..... 1
Memoirs of the Geological Survey of India..... 1
Cretaceans of Southern India—
Vol. 3, Nos. 1 to 4, Series 6, Pelecypoda 1
Vol. 3, Nos. 5 to 8, Series 6, Pelecypoda 1
By Frederick Holiczka—
Vol. 7, Part 1..... 1
Vol. 7, Part 2..... 1
Vol. 7, Part 3..... 1
Record of the Geological Survey of India—
Vol. 1 1
Vol. 2 1
Vol. 2, Part 2, 1869 1
Vol. 2, Part 3, 1869 1
Vol. 2, Part 4, 1869 1
Vol. 3, 1870 1
Vol. 4, Part 1, 1871 1
Vol. 4, Part 2, 1871 1
Abhandlungen, &c., Zu Bremen 2 Bo. Ill. Haft 1
Bulletin de la Societè Géologique de France, Tome—
Vingt Huitième, Quillett, 1870–71 1
" " Septième, 1869–70; Quillett, 1870 1
" " Sixième, 1868–69..... 1
Table Générale des Articles, Tome Vingt Septième, 1869–70..... 1
Le Névé de Instidal et ses Glaciers par C. D. Sue..... 1
Om Skuringsmærker Glacial formationen og Terasser, &c. 1
Carcionologiske Bidrag tiil Norges Fauna af. G. G. Sars. Christiania .. 1
Beritninger om Norges Deeltagelse i den Almendelige, &c. 1
Stockholm, 1876, Christiania Net Gongelege Norske, &c., 1869 1
Beretnung om Bodsfamgflets Virksomshed, 1869..... 1
Index Scholarum, &c., 1870..... 2
Generalbertning, &c., 1869..... 1
Foreningen till Norske Fortidsmi, &c., 1869 1
Storthings Efterretninger te, 1871, Christiania..... 1
Det Kongelige Norske, 1870..... 1
Christiania omgns Phanerogamer, &c. af A. Blytt. Chris. 1870..... 1
Nyt Magazine, Blytt. Chris. 1870 2
" " for Naturvidenskabsme, &c., 1870 1
" " " 1870 1
" " " 1871 1
Forhandliger i Vinderiskabssilskabet, Christiania, 1869..... 1
" " 1870 1
Norke Meteorologisk aarbog for 1869, udjevit af del Norke metéorogiske institute 3 dies aargong 1
Rapport sur les Travaux la Societe de Physique, &c., 1st June, 1871 .. 1
Aurora Polare Observaten Piemonte Del Prof. Francisco Denza 1

Aurora Boréale Par P. F. Denza 1
Aurora Polare del 1869, " 1
Observazione delle Meteore Lumenose del, 1871-2 1
Sopra gli aerolite, &c. 1
Le stelle Cadente, &c. Del P. F. Denza 1
From the Linnean Society—
List of the Society, 1870 1
Additions to the Library 2
Proceedings of November 3, 1870 1
" December 15, 1870 1
Obituary Notices.
The Journal: Zoology, No. 49 1
" " No. 50 1
" " No. 51 1
" " No 52 1
Botany, Nos. 54 & 55 1
" No. 56 1
" No. 65 1
From the Cobden Club—
Commercial Policy of France, and the Treaty with England, for the Cobden Club 4
From Prof. Nicholson, M.A., M.D.—
Manual of Zoology 1
From S. Spreull, Esq.—
A General Atlas 1
Vols. of the Journal de L'Instruction Publique, Quebec, for the years 1867, '68, '69 and '70, and the Journal of Education for same years 8
From the Hon. J. M. Brodhead, of Washington—
Executive Documents Nos. 253 to 259, 2nd Session, 1867-8, 40th Congress; 1st Session, 41st Congress, 1869; 3rd Session, 40th Congress, No. 50 to 82, 1868-9 3
Impeachment of Andrew Johnson, Vol. 1, 2, 3 2
Annual Report of the Commissioner of Internal Revenue, year ending 30th June, 1871 1
Final Report of the United States Geological Survey of Nebraska.... 1
Smithsonian Report, 3rd Session, 40th Congress, 1868-69..... 1
Annual Report of the Chief of the Bureau of Statistics, &c., 1871 1
Finance Report, 1871 1
Diplomatic Correspondence, 2nd Session, 39th Congress, Vol. 2, 1866-7 1
Report on Indian Affairs, 1869 1
Land Office Report, 1871 1
Statistics of Population of the United States, 9th Census 1

CANADIAN LOCAL HISTORY.

TORONTO OF OLD:

A SERIES OF COLLECTIONS AND RECOLLECTIONS.

BY THE REV. DR. SCADDING.

LIII.—(*Continued.*)—YONGE STREET FROM BOND'S LAKE TO THE SUMMIT OF THE RIDGES.

There are some representatives of the original émigrès still to be met with in the neighbourhood of the Oak Ridges; but they have not in every instance continued to be seized of the lands granted in 1798. The Comte de Chalûs, son of René Augustin, retains property here; but he resides in Montreal. An estate, however, at the distance of one lot eastward from Yonge Street, in Whitchurch, is yet in the actual occupation of a direct descendant of one of the first settlers in this region. Mr. Henry Quetton St. George here engages with energy in the various operations of a practical farmer, on land inherited immediately from his father, the Chevalier de St. George, at the same time dispensing to his many friends a refined hospitality. If at Glenlonely the circular turrets and pointed roofs of the old French château are not to be seen,—what is of greater importance, the amenities and gentle life of the old French château are to be found. Moreover, by another successful enterprise added to agriculture, the present proprietor of Glenlonely has brought it to pass that the name of St. George is no longer suggestive, as in the first instance it was, of wars in La Vendèe and fightings on the Garonne and Dordogne, but redolent in Canada, far and wide, only of vineyards in Languedoc and of pleasant wines from across the Pyrenees.

A large group of superior farm buildings, formerly seen on the right just after the turn which leads to Glenlonely, bore the graceful name of Larchmere,—an appellation glancing at the mere or little lake within view of the windows of the house: a sheet of water more generally known as Lake Willcocks—so called from an early owner of the spot, Col. Willcocks, of whom we have spoken in another section. Larchmere was for some time the home of his great grandson, William Willcocks Baldwin. The house has since been destroyed by fire.

Just beneath the surface of the soil on the borders of the lakelets of the Ridges, was early noticed a plentiful deposit of white shell-marl, resembling the substance brought up from the oozy floor of the Atlantic in the soundings preparatory to laying the telegraph-cable. It was, in fact, incipient chalk. It used to be employed in the composition of a whitewash for walls and fences. It may since have been found of value as a manure. In these quarters, as elsewhere in Canada, fine specimens of the antlers of the Wapiti, or great American stag, were occasionally dug up.

The summit level of the Ridges was now reached, the most elevated land in this part of the basin of the St. Lawrence; a height however, after all, of only about eight hundred feet above the level of the sea. The attention of the wayfarer was hereabout always directed to a small stream, which the road crossed, flowing out of Lake Willcocks: and then a short distance further on, he was desired to notice a slight swale or shallow morass on the left. The stream in question, he was told, was the infant Humber, just starting south for Lake Ontario; while the swale or morass, he was assured, was a feeder of the east branch of the Holland River, flowing north into Lake Simcoe.

Notwithstanding the comparative nearness to each other of the waters of the Holland and the Humber, thus made visible to the eye, the earliest project of a canal in these parts was for the connexion, not of the Holland river and the Humber, but of the Holland river and the Rouge or Nen. The Mississagua Indians attached great importance to the Rouge and its valley

as a link in one of their ancient trails between Huron and Ontario; and they seem to have imparted to the first white men their own notions on the subject. "It apparently rises," says the *Gazetteer* of 1799, speaking of the Rouge or Nen, "in the vicinity of one of the branches of Holland's river, with which it will probably, at some future period, be connected by a Canal." A "proposed Canal" is accordingly here marked on one of the first manuscript maps of Upper Canada.

Father St. Lawrence and Father Mississippi pour their streams—so travellers assure us—from urns situated at no great distance apart. Lake Itaska and its vicinity, just west of Lake Superior, possess a charm for this reason. In like manner, to compare small things with great, the particular quarter of the Ridges where the waters of the Humber and the Holland used to be seen in near proximity to each other, had always with ourselves a special interest. Two small lakes, called respectively Lake Sproxton and Lake Simon, important feeders of the Rouge, a little to the east of the Glenlonely property, and situated very close to streams that pass into the east branch of the Holland river: so that the conjecture of the author of the *Gazetteer* was a good one. He says, "apparently the sources of the Rouge and Holland lie near each other."

After passing the notable locality of the Ridges just spoken of, the land began perceptibly to decline; and soon emerging from the confused glens and hillocks and woods that had long on every side been hedging in the view, we suddenly came out upon a brow where a wide prospect was obtained, stretching far to the north, and far to the east and west. From such an elevation, the acres here and there denuded of their woods by the solitary axeman could not be distinguished: accordingly, the panorama presented here for many a year continued to be exactly that which met the eyes of the first exploring party from York in 1793. As we used to see it, it seemed in effect to be an unbroken forest: in the foreground bold and billowy and of every variety of green; in the middle distance assuming neutral, indistinct tints, as it dipped down into what looked like a wide vale: then apparently rising by successive gentle stages, coloured now deep violet, now a tender blue, up to the line of the sky. In a depression in the far horizon, immediately in front, was seen the silvery sheen of water. This, of course, was the lake known since 1793 as Lake Simcoe; but previously spoken of by the French sometimes as Lake Sinion or Sheniong; sometimes as Lake Ouentironk, Ouentaron, and Toronto—the very name which is so familiar to us now, as appertaining to a locality thirty miles southward of this lake. The French also in their own tongue sometimes designated it, perhaps for some reason connected with fishing operations, *Lac aux Claies*, Hurdle Lake. Thus in the *Gazetteer* of 1799 we have, "Simcoe Lake: formerly Lake aux Claies, Ouentironk, or Sheniong, situated between York and Gloucester upon Lake Huron: it has a few small islands and several good harbours." And again on another page of the same *Gazetteer*, we have the article: "Toronto Lake (or Toronto): lake le Clie [i.e., Lac aux Claies] was formerly so called by some: others," the same article proceeds to say, "called the chain of lakes from the vicinity of Matchedash towards the head of the Bay of Quintè, the Toronto lakes and the communication from the one to the other was called the Toronto river:" whilst in another place in the *Gazetteer* we have the information given us that the Humber was also styled the Toronto river, thus: "Toronto river: called by some St. John's: now called the Humber." We shall presently see how the name Toronto came to be thus variously applied.

The region of which we obtained a distant view, where

"The bursting prospect spreads immense around"

on the northern brow of the Ridges, is a classic one, renowned in the history of the Wyandots or Hurons, and in the early French missionary annals.

The peninsula included between Notawasaga bay, Matchedash or Sturgeon bay, the river Severn, Lake Conchichin and Lake Simcoe, was a locality, in former [times, largely frequented by the native tribes. It was especially the head-quarters of the Wyandots or Hurons. Villages, burial-grounds, and cultivated lands abounded in it. Unusual numbers of the red men congregated there. It was, in short, the place of concourse, the place of meeting, indicated by the Huron term, which European lips have conveniently moulded into "Toronto." Gabriel Sagard has it in his "Dictionnaire de la Langue Huronne," published at Paris in 1636, in the form *Toronton*, and he translates it *Il y en a beaucoup*—there's plenty; whether of men or of nything else. He has killed many Tsonontouans: Toronton Tsonontouan ahouyo.

Not that we are to suppose the Hurons employed the word Toronto as a proper name. We know the aborigines used, for the most part, no proper names of places in our sense of the term. Their names of places were simply descriptions, or allusions to incidents. But the vocable TORONTO was observed by the white men to be emphatically uttered by their red companions, when pointing to the region round Lake Simcoe or when speeding on towards it; and that vocable was accordingly caught up and finally made use of as a proper local name in the European sense; just as already the word CANADA had been; from its sound having been continually heard on the lips of the red men in the Lower St. Lawrence as they pointed in the direction of their huts or villages on the shore, the word Canada meaning simply "huts."

We may now see how it happened, as the old *Gazetteer* states and the early French maps shew, that Lake Simcoe was once called Toronto Lake. It was a notable sheet of water in the well-peopled region. We may also see how the Trent communication was sometimes called the Toronto river. It was a notable water highway from the south-east to the well-peopled region. And for a similar reason the Humber was likewise called by some the Toronto river. Its valley contained a travelled trail from the south to the same well-peopled region. It may be added that besides the waters and streams stated by the old *Gazetteer* to have once borne the name of Toronto, old maps and old French books of travel shew that Matchedash bay or Sturgeon bay, as we now call it, was once known as the Bay of Toronto; and the Severn, as one more Toronto river, these constituting, as is manifest by a glance at the map, a grand line of approach to the well-peopled region from the North-West.

And finally, it may now be seen how it happened that the spot on which stands the modern capital of Ontario came to acquire the name which it possesses, the sole use of which it has almost monopolized.

The mouth of the Humber, or rather a point towards the eastern side of the indentation known as Humber bay, was the landing-place of hunting-parties, trading-parties, war-parties, on their way to the north—on their way to the well-peopled region in the vicinity of Lake Simcoe. They disembarked here for the tramp to Toronto. It was the Toronto landing-place: the landing-place for wayfarers bound to Toronto. And gradually the starting-place took the name of the goal: the style and title of the terminus *ad quem* were usurped by the terminus *a quo*.

Thus it happened at length also that the stockaded trading-port in the course of time established here, near the indentation of Humber bay, came to be popularly known as Fort Toronto, although its actual name in the French official records was Fort Rouillé—a designation given it in compliment to Antoine Louis Rouillé, Count de Jouy, home colonial minister from 1749-54.

As to the signification which has been assigned to the word Toronto, of "trees rising out of the water"—we think the interpretation has arisen from a misunderstanding of language used by the Indian canoe-men. The Indian canoe-men, in coasting along the shore of Lake Ontario from the east or west would, we may conceive, point to "trees rising out of the water," the black poplars and pines of the Toronto island or peninsula, as a familiar landmark, shewing the place where they were to disembark for the populous region to the north. The white men, mixing together the facts indicated by the canoe-men's words, made of the expressions "trees rising out of the water" and "Toronto," equivalent terms, which they were not and were not intended so to be taken. As to the idea to which Capt. Bonnycastle gave some currency, by recording it in one of his books on Canada—that Toronto or Torento was perhaps the name of an Italian engineer concerned in the construction of the Fort—it is sufficient to reply that we happen to know what the official name of the Fort was: it was Fort Rouillé, as has just been stated. Sorel, we believe, and Chambly and Schlosser, and possibly other places, derived their names from officers in the French service. But Capt. Bonnycastle's derivation for Toronto has no foundation whatever in the early annals of Canada. It was probably a mere after-dinner conversational conjecture. We meet with the name Toronto under several different forms in the French and English documents, but the variety has evidently arisen from the attempts of Frenchmen and Englishmen to represent, each as he best could, a native vocable which had previously not been reduced to writing. The same variety, and from the same cause, occurs in a multitude of other aboriginal terms.

It did not chance to enter into the poet Longfellow's plan to lay the scene of any portion of his song of Hiawatha in the Lake Simcoe region. The legends gathered by him

From the great lakes of the Northland,
From the mountains, moors and fenlands,
Where the heron, the Shuh-shuh-gah,
Feeds among the reeds and rushes—

tell of an era just anterior to the period when that district becomes invested with interest for us. Francis Parkman, however, in an agreeably written work, entitled "The Jesuits in North America in the Seventeenth Century," has dwelt somewhat at length on the history of the locality referred to—the well-peopled Toronto region, of which we obtain a kind of Pisgah-view from the brow of the Ridges as we travel north. In the early Reports of the Jesuit fathers themselves, too, this area figures largely. They, in fact, constructed a map of the locality, which must have led the central mission-board of their association, at Rome, to believe that this portion of Western Canada was as thickly strewn with villages and towns as a district of equal area in old France. In the "Chorographia Regionis Huronum," attached to Father du Creux's Map of New France, of the date 1660, given in Bressani's Abridgment of the Relations, we have the following places conspicuously marked as stations or sub-missions in the peninsula bounded by the bays and lakes and rivers above enumerated, implying population in and round each of them:—St. Xavier, St. Charles, St. Louis, St. Ignatius, St. Denis, St. Joachim, St. Athanasius, St. Elizabeth, St. John the Baptist, St. Joseph, St. Mary, St. Michael, La Conception, St. Mary Magdalene, and others.

In Schoolcraft's American Indians, p. 130, ed. 1851, the scene of the story of Aingodon and Naywadaha is laid at Toronto, by which is meant probably a spot close to Lake Simcoe, and not the trading-post of Toronto on Lake Ontario.

LIV.—YONGE STREET, FROM THE SUMMIT TO THE RIDGES OF THE NEW-MARKET ROAD.

But we must push on. The end of our journey is in sight. The impediments to our advance have been innumerable, but unavoidable. In spite of appearances, "Semper ad eventum festina" has all along been secretly goading us forward.

The farmhouses and their surroundings in the Quaker settlement through which, after descending faom the Ridges on the northern side, we passed, came to be notable at an early date for a characteristic neatness, completeness, and visible judiciousness; and for an air of enviable general comfort and prosperity. The farmers here were emigrants chiefly from Pennsylvania. Coming from a quarter where large tracts had been rapidly transformed by human toil from a state of nature to a condition of high cultivation, they brought with them an inherited experience in regard to such matters; and on planting themselves down in the midst of an unbroken wild, they regarded the situation with more intelligence perhaps than the ordinary emigrant from the British Islands and interior of Germany, and so, unretarded by blunders and by doubts as to the issue, were enabled very speedily to turn their industry to profitable account.

The old *Gazetteer* of 1799 speaks in an exalted sentimental strain of an emigration then going on from the United States into Canada. "The loyal peasant," it says, "sighing after the government he lost by the late revolution, travels from Pennsylvania in search of his former laws and protection; and having his expectations fulfilled by new marks of favour from the Crown in a grant of lands, he turns his plough at once into these fertile plains [the immediate reference is to the neighbourhood of Woodhouse on Lake Erie], and an abundant crop reminds him of his gratitude to his God and to his king." We do not know for certain whether the Quaker settlers of the region north of the Ridges came into Canada under the influence of feelings exactly such as those described by the *Gazetteer* of 1799. In 1806, however, we find them coming forward in a body to congratulate a new Lieutenant-Governor on his arrival in Upper Canada. In the *Gazette* of Oct. 4, 1806, we read: "On Tuesday, the 30th September (1806), the following address from the Quakers residing on Yonge Street was presented to his Excellency the Lieutenant-Governor: "The Society of the people called Quakers, to Francis Gore, Governor of Upper Canada, sendeth greeting. Notwithstanding we are a people who hold forth to the world a principle which in many respects differs from the greater part of mankind, yet we believe it our reasonable duty, as saith the Apostle, 'Submit yourselves unto every ordinance of man for the Lord's sake, whether it be the king as supreme, or unto gover-

nors as unto them that are sent by him for the punishment of evil doers, and for the praise of them that do well:' in this we hope to be his humble and peaceful subjects. Although we cannot for conscience sake join with many of our fellow-mortals in complimentary customs of man, neither in taking up the sword in order to shed human blood—for the Scripture saith that 'it is righteousness that exalteth a nation, but sin is a reproach to any people'—we feel concerned for thy welfare and the prosperity of the province, hoping thy administration may be such as to be a terror to the evil-minded and a pleasure to them that do well: then will the province flourish and prosper under thy direction; which is the earnest desire and prayer of thy sincere friends.—Read and approved in Yonge Street monthly meeting, held the 18th day of the ninth month, 1806. Timothy Rogers and Amos Armitage are appointed to attend on the governor therewith. Signed by order of the said meeting, Nathaniel Pearson, clerk."

To this address, characteristic alike in the peculiar syntax of its sentences and in the well-meant platitudes to which it gives expression, his Excellency was pleased to return the following answer: "I return you my thanks for your dutiful address and for your good wishes for my welfare and prosperity of this province. I have no doubt of your proving peaceful and good subjects to his majesty, as well as industrious and respectable members of society. I shall at all times be happy to afford to such persons my countenance and support. Francis Gore, Lieut.-Governor. Government House, York, Upper Canada, 30th Sep., 1806."

The Timothy Rogers here named bore a leading part in the first establishment of the Quaker settlement. He and Jacob Lundy were the two original managers of its affairs. On the arrival of Governor Peter Hunter, predecessor to Gov. Gore, Timothy Rogers and Jacob Lundy with a deputation from the settlement, came into town to complain to him of the delay which they and their co-religionists had experienced in obtaining the patents for their lands.

Governor Hunter, who was also Commander-in-Chief and a Lieut.-General in the army, received them in the garrison: and after hearing how on coming to York on former occasions they had been sent about from one office to another for a reply to their inquiries about the patents, he requested them to come to him again the next day at noon. Orders were the same instant despatched to Mr. D. W. Smith, the Surveyor-General, to Mr. Small, Clerk of the Executive Council, to Mr. Burns, Clerk of the Crown, and to Mr. Jarvis, Secretary and Registrar of the Province (all of whom it appeared at one time or another had failed to reply satisfactorily to the Quakers), to wait at the same hour on the Lieut.-Governor, bringing with them, each respectively, such papers and memoranda as might be in their possession, having relation to patents for lands in Whitchurch and King.

Governor Hunter had a reputation for considerable severity of character; and all functionaries, from the judge on the bench to the humblest employé, held office in those days very literally during pleasure.

"These gentlemen complain,"—the personages above enumerated having assembled together with the deputation from Yonge Street—"These gentlemen complain," the Governor said, pointing to the Quakers, "that they cannot get their patents."

Each of the official personages present offered in succession some indistinct observations; expressive it would seem of a degree of regret, and hinting exculpatory reasons, so far as he individually was concerned.

On closer interrogation, one thing however came out very clear, that the order for the patents was more than twelve months' old.

At length the onus of blame seemed to settle down on the head of the Secretary and Registrar, Mr. Jarvis, who could only say that really the pressure of business in his office was so great that he had been absolutely unable, up to the present moment, to get ready the particular patents referred to.

"Sir!" was the Governor's immediate rejoinder, "if they are not forthcoming, every one of them, and placed in the hands of these gentlemen here in my presence at noon on Thursday next (it was now Tuesday), by George! I'll un-Jarvis you!"—implying, as we suppose, a summary congé from office.

It is needless to say that Mr. Rogers and his colleagues of the deputation carried back with them to Whitchurch lively accounts of the vigour and rigour of the new Governor—as well as their patents.

General Hunter was very peremptory in his dismissals occasionally. In a *Gazette* of July 16, 1803, is to be seen an ominous announcement that the Governor is going to be very strict with

the Government clerks in regard to hours: "Lieut.-Governor's office, 21st June, 1803. Notice is hereby given that regular attendance for the transaction of the public business of the Province will in future be given at the office of the Secretary of the Province, the Executive Council office, and the Surveyor-General's office, every day in the year (Sundays, Good Friday, and Christmas day only excepted) from ten o'clock in the morning until three in the afternoon, and from five o'clock in the afternoon until seven in the evening. By order of the Lieutenant-Governor, Jas. Green, Secretary."

Soon after the appearance of this notice, it happened one forenoon that young Alexander Macnab, a clerk in one of the public offices, was innocently watching the Governor's debarkation from a boat, preparatory to his being conveyed up to the Council-chamber in a sedan-chair which was in waiting for him. The youth suddenly caught his Excellency's eye, and was asked —"What business he had to be there? Did he not belong to the Surveyor-General's office? Sir! your services are no longer required!"

For this same young Macnab, thus summarily dismissed, Governor Hunter, we have been told, procured subsequently a commission. He attained the rank of captain and met a soldier's fate on the field of Waterloo, the only Upper Canadian known to have been engaged or to have fallen in that famous battle. (So late as 1868 Capt. Macnab's Waterloo medal was presented, by the Duke of Cambridge personally, to the Rev. Dr. Macnab, of Bowmanville, nephew of the deceased officer.)

Two stray characteristic items relating to Governor Hunter may here be subjoined. The following was his brief reply to the Address of the Inhabitants of York on his arrival there in 1799. "Gentlemen: Nothing that is in my power shall be wanting to contribute to the happiness and welfare of this colony." (*Gazette*, Aug. 24, 1799.) At Niagara, an Address from "the mechanics and husbandmen" was refused by him, on the ground that an address professedly from the inhabitants generally had been presented already. On this, the *Constellation* of Sep. 10, (1799), prints the following "anecdote," which is a hit at Gov. Hunter. "Anecdote.—When Governor Simcoe arrived at Kingston on his way here to take upon him the government of the Province, the magistrates and gentlemen of that town presented him with a very polite address. It was politely and verbally answered. The inhabitants of the country and town, who move not in the upper circles, presented theirs. And this also his Excellency very politely answered, and the answer being in writing, is carefully preserved to this day."

Among the patents carried home by Mr. Timothy Rogers, above named, were at least seven in which he was more or less personally interested. His own lot was 95 on the west or King side of Yonge Street. Immediately in front of him on the Whitchurch or east side, on lots 91, 92, 93, 94, 95, and 96, all in a row, were enjoyed by sons or near relatives of his, bearing the names respectively of Rufus Rogers, Asa Rogers, Isaac Rogers, Wing Rogers, James Rogers, and Obadiah Rogers.

Mr. Lundy's name does not appear among those of the original patentees; but lots or portions of lots in the "Quaker Settlement" are marked at an earlier period with the names of Shadrach Lundy, Oliver Lundy, Jacob Lundy, Reuben Lundy, and perhaps more.

In the region just beyond the Ridges there were farmers also of the community known as Mennonists or Tunkers. Long beards, when such appendages were rarities, dangling hair, antique-shaped, buttonless, home-spun coats, and wide-brimmed low-crowned hats, made these persons conspicuous on the street. On the seat of a loaded country-waggon, or on the back of a solitary rustic nag, would now and then be seen a man of this community, who might pass for John Huss or John á Lasco, as represented in the pictures. It was always curious to gaze upon these waifs and strays from old Holland, perpetuating, or at least trying to perpetuate, on a new continent, customs and notions originating in the peculiar circumstances of obscure localities in another hemisphere three hundred years ago.

Simon Menno, the founder and prophet of the Mennonists, was a native of Friesland in 1496. He advocated the utmost rigour of life. Although there are, as we are informed, modernized Mennonists now in Holland, at Amsterdam for example, who are distinguished for luxury in their tables, their equipages and their country-seats, yet a sub-section of the community known as Uke-Wallists, from one Uke Walles, adhere to the primitive strictness enjoined by Menno. Their apparel, we are told, is mean beyond expression, and they avoid everything that has the most distant appearance of elegance or ornament. They let their beards grow to an enormous length; their hair, uncombed, lies in a disorderly manner on their shoulders; their

countenances are marked with the strongest lines of dejection and melancholy; and their habitations and household furniture are such as are only fitted to answer the demands of mere necessity. "We shall not enlarge," Mosheim adds, "upon the circumstances of their ritual, but only observe that they prevent all attempts to alter or modify their religious discipline, by preserving their people from everything that bears the remotest aspect of learning and science; from whatever, in a word, may have a tendency to enlighten their devout ignorance."

The sympathies of our primitive Tunkers beyond the Ridges were, as we may suppose, with this section of the fatherland Mennonists.

Thus, to get the clue to social phenomena which we see around us here in Canada, we have to concern ourselves occasionally with uninviting pages, not only of Irish, Scottish and English religious history, but of German and Netherlandish religious history likewise. Pity 'tis, in some respects, that on a new continent our immigrants could not have made a *tabula rasa* of the past, and taken a start *de novo* on another level—a higher one; on a new guage—a widened one.

Though only a minute fraction of our population, an exception was early made by the local parliament in favour of the Mennonists or Tunkers, allowing them to make affirmations in the Courts, like the Quakers, and to compound for military service.—Like Lollard, Quaker and some other similar terms, Tunker, *i.e.* Dipper, was probably at first used in a spirit of ridicule.

LV.—YONGE STREET: DIGRESSION TO NEWMARKET AND SHARON.

When Newmarket came in view off to the right, a large portion of the traffic of the street turned aside for a certain distance out of the straight route to the north, in that direction.

About this point the ancient dwellers at York used to take note of signs that they had passed into a higher latitude. Half a degree to the south of their homes—at Niagara, for example—they were in the land, if not of the citron and myrtle, certainly of the tulip-tree and pawpaw—where the edible chestnut grew plentifully in the natural woods, and the peach luxuriantly flourished.

Now, half a degree the other way, in the tramontane region north of the Ridges, they found themselves in the presence of a vegetation that spoke of an advance, however minute, towards the pole. Here, all along the wayside, beautiful specimens of the spruce-pine and balsam-fir, strangers in the forest about York, were encountered. Sweeping the sward with their drooping branches and sending up their dark green spires high in the air, these trees were always regarded with interest, and desired as graceful objects worthy to be transferred to the lawn or ornamental shrubbery.

A little way off the road, on the left, just before the turn leading to Newmarket, was the great Quaker meeting-house of this region—the "Friends' Meeting-house"—a building of the usual plain cast, generally seen with its solid shutters closed up. This was the successor of the first Quaker meeting-house in Upper Canada. Here Mr. Joseph John Gurney, the eminent English Quaker, who travelled on this continent in 1837–40, delivered several addresses, with a view especially to the re-uniting, if possible, of the Orthodox and the Hicksites.

Gourlay, in his "Statistical Account of Upper Canada," took note that this Quaker meeting-house and a wooden chapel at Hogg's Hollow, belonging to the Church of England, were the only two places of public worship to be seen on Yonge Street between York and the Holland Landing—a distance, he says, of nearly forty miles. This was in 1817.

Following now the wheel-marks of clearly the majority of vehicles travelling on the street, we turn aside to Newmarket.

Newmarket had for its germ or nucleus the mills and stores of Mr. Elisha Beaman, who emigrated hither from the State of New York in 1806. Here also, on the branch of the Holland river, mills at an early date were established by Mr. Mordecai Millard, and tanneries by Mr. Joseph Hill. Mr. Beaman's mills became subsequently the property of Mr. Peter Robinson, who was Commissioner of Crown Lands in 1827, and one of the representatives of the united counties of York and Simcoe; and afterwards, the property of his brother, Mr. W. B. Robinson, who for a time resided here, and for a number of years represented the County of Simcoe in the provincial parliament. Most gentlemen travelling north or to the north-west brought with them, from friends in York, a note of commendation to Mr. Robinson, whose friendly and hospitable disposition were well known:

"Fast by the road his ever-open door
Oblig'd the wealthy and reliev'd the poor."

Governors, commodores, and commanders-in-chief, on their tours of pleasure or duty, were glad to find a momentary resting-place at a refined domestic fireside. Here Sir John Franklin was entertained for some days in 1835: and at other periods, Sir John Ross and Capt. Back, when on their way to the Arctic regions. In 1847, Mr. W. B. Robinson was Commissioner of Public Works; and, at a later period, one of the Chief Commissioners of the Canada Company. Mr. Peter Robinson was instrumental in settling the region in which our Canadian Peterborough is situated, and from him that town has its name.

At Newmarket was long engaged in prosperous business Mr. John Cawthra, a member of the millionaire family of that name. Mr. John Cawthra was the first representative in the Provincial Parliament of the County of Simcoe, after the separation from the County of York. In 1812, Mr. John Cawthra and his brother Jonathan were among the volunteers who offered themselves for the defence of the country. Though by nature inclined to peace, they were impelled to this by a sincere sense of duty. At Detroit, John assisted in conveying across the river in scows the heavy guns which were expected to be wanted in the attack on the Fort. On the slopes at Queenston, Jonathan had a hair-breadth escape. At the direction of his officer, he moved from the rear to the front of his company, giving place to a comrade, who the following instant had a portion of his leg carried away by a shot from Fort Gray, on the opposite side of the river. Also at Queenston, John, after personally cautioning Col. Macdonell against rashly exposing himself, as he seemed to be doing, was called on a few moments afterwards, to aid in carrying that officer to the rear, mortally wounded.

With Newmarket too is associated the name of Mr. William Roe, a merchant there since 1814, engaged at one time largely in the fur-trade. It was Mr. Roe who saved from capture a considerable portion of the public funds, when York fell into the hands of General Dearborn and Commodore Chauncey in 1813. Mr. Roe was at the time an employè in the office of the Receiver General, Prideaux Selby; and by the order of General Sheaffe and the Executive Council he conveyed three bags of gold and a large sum in army-bills to the farm of Chief Justice Robinson, on the Kingston road east of the Don bridge, and there buried them. The army-bills were afterwards delivered up to the enemy; but the gold remained secreted until the departure of the invaders, and was handed over to the authorities in Dr. Strachan's parlour by Mr. Roe. The Receiver General's iron chest was also rescued by Mr. Roe and deposited in the premises of Mr. Donald McLean, Clerk of the House of Assembly. Mr. McLean was killed while bravely opposing the landing of the Americans, and his house was plundered; the strong chest was broken open and about one thousand silver dollars were taken therefrom.

The name of Mr. Roe's partner at Newmarket, Mr. Andrew Borland, is likewise associated with the taking of York in 1813. He was made prisoner in the fight, and in the actual struggle against capture he received six severe rifle wounds, from the effects of which he never wholly recovered. He had also been engaged at Queenston and Detroit. In the Report of the Loyal and Patriotic Society of Upper Canada, we have an entry made of a donation of sixty dollars to Mr. Andrew Borland on the 11th June, 1813, with the note appended: "The committee of the Loyal and Patriotic Society voted this sum to Mr. Borland for his patriotic and eminent services at Detroit, Queenston and York, at which latter place he was severely wounded." We also learn from the Report that Mr. D'Arcy Boulton had presented a petition to the Society in favour of Mr. Borland. The members of committee present at the meeting held June 11th, 1813, were Rev. Dr. Strachan, chairman, Wm. Chewett, Esq., Wm. Allan, Esq., John Small, Esq., and Alex. Wood, Esq., secretary: and the minutes state that "The petition of D'Arcy Boulton, Esq., a member of the Society, in favour of Andrew Borland, was taken into consideration, and the sum of Sixty Dollars was voted to him, on account of his patriotic and eminent services at Detroit, Queenston and York, at which latter place he was most severely wounded." Mr. Borland had been a clerk in Mr. Boulton's store. In the order to pay the money, signed by Alexander Wood, Mr. Borland is styled "a volunteer in the York Militia." He afterwards had a pension of Twenty Pounds a year. In 1838 his patriotic ardour was not quenched. During the troubles of that period he undertook the command of 200 Indians who had volunteered to fight in defence of the rights of the Crown of England, if there should be need. They were stationed for a time at the Holland Landing, but their services were happily not required.

From being endowed with great energy of character, and having also a familiar knowledge of the native dialects, Mr. Borland had great influence with the Indian tribes frequenting the coasts of Lakes Huron and Simcoe. Mr. Roe likewise, in his dealings with the aborigines, had acquired a considerable facility in speaking the Chippewa dialect, and had much influence among the natives.

Let us not omit to record, too, that at Newmarket, not very many years since, was successfully practising a grandson of Sir William Blackstone, the commentator on the Laws of England—Mr. Henry Blackstone, whose conspicuous talents gave promise of an eminence in his profession not unworthy of the name he bore. But his career was cut short by death.

The varied character of colonial society, especially in its early crude state, the living elements mixed up in it, and the curious changes and interchanges that take place in the course of its development and consolidation, receive illustrations from ecclesiastical as well as civil annals. We ourselves remember the church-edifice of the Anglican communion at Newmarket when it was an unplastered, unlathed clap-board shell, having repeatedly officiated in it while in that stage of its existence. Since then the congregation represented by this clap-board shell have had as pastors men like the following: a graduate of Trinity College, Dublin, not undistinguished in his university, a protegè of the famous Archbishop Magee, a co-worker for a time of the distinguished Dr. Walter Farquhar Hook of Leeds, and minister of one of the modern churches there—the Rev. Robert Taylor, afterwards of Peterborough here in Canada. And since his incumbency, they have been ministered to by a former vicar of a prominent church in London, St. Michael's, Burleigh Street, a dependency of St. Martin's in Trafalgar Square—the Rev. Septimus Ramsay, who was also long the chief secretary and manager of a well known Colonial Missionary Society which had its headquarters in London. While, on the other hand, an intervening pastor of the same congregation, educated for the ministry here in Canada and admitted to Holy Orders here, was transferred from Newmarket first to the vicarage of Somerton in Somersetshire, England, and, secondly, to the rectory of Clenchwarden in the county of Norfolk in England—the Rev. R. Athill. And another intervening incumbent was, after having been also trained for the ministry and admitted to orders here in Canada, called subsequently to clerical work in the United States, being finally appointed one of the canons of the cathedral church at Chicago, by Bishop Whitehouse of Illinois: this was the Rev. G. C. Street, a near relative of the distinguished English architect of that name, designer and builder of the New Law Courts in London.

As to the name "Newmarket"—in its adoption there was no desire to set up in Canada a memorial of the famous English Cambridgeshire racing town. The title chosen for the place was an announcement to this effect: "Here is an additional mart for the convenience of an increased population: a place where farmers and others may purchase and exchange commodities without being at the trouble of a journey to York or elsewhere." The name of the Canadian Newmarket, in fact, arose as probably that of the English Newmarket itself arose, when first established as a newly-opened place of trade for the primitive farmers and others of East Anglia and Mercia in the Anglo-Saxon period.

It deserves to be added that the English church at Newmarket was, a few years back, to some extent endowed by a generous gift of valuable land made by Dr. Beswick, a bachelor medical man, whose large white house on a knoll by the wayside was always noted by the traveller from York as he turned aside from Yonge Street for Newmarket.

Proceeding onwards now from Newmarket, we speedily come to the village of Sharon (or Hope as it was once named), situated also off the direct northern route of Yonge Street.

David Willson, the great notability and founder of the place, had been in his younger days a sailor, and, as such, had visited the Chinese ports. After joining the Quakers, he taught for a time amongst them as a schoolmaster. For some proceeding of his, or for some peculiarity of religious opinion, difficult to define, he was cut off from the Hicksite sub-division of the Quaker body. He then began the formation of a denomination of his own. In the bold policy of giving to his personal ideas an outward embodiment in the form of a conspicuous Temple, he anticipated the shrewd prophets of the Mormons, Joseph and Hiram Smith. Willson's building was erected about 1825. Nauvoo was not commenced until the spring of 1840.

In a little pamphlet published at Philadelphia in 1815, Willson gives the following account of himself: "I, the writer," he says, "was born of Presbyterian parents in the county of Duchess, state of New York, in North America. In 1801 I removed with my family into this

province (Upper Canada), and after a few years became a member of the Society of the Quakers at my own request, as I chose a spiritual people for my brethren and sisters in religion. But after I had been a member thereof about seven years, I began to speak something of my knowledge of God or a Divine Being in the heart, soul or mind of man, all which signifies the same to my understanding,—but my language was offensive, my spirit was abhorred, my person was disdained, my company was forsaken by my brethren and sisters. After which I retired from the society and was disowned by them for so doing; but several retired with me and were disowned also, because they would not unite in the disowning and condemning the fruits of my spirit; for, as I had been accounted a faithful member of the society for many years, they did not like to be hasty in condemnation. Therefore we became a separate people, and assembled ourselves together under a separate order which I immediately formed. After I retired from my former meetings—as our discipline led to peace with all people more than any one in my knowledge—we called ourselves Children of Peace, because we were but young therein."

The following account of the Temple erected by Willson at Sharon is by a visitor to the village in 1835. "The building," says Mr. Patrick Shirreff in his "Tour through North America," published in Edinburgh in 1835, "is of wood painted white externally, seventy feet high; and consists of three storeys. The first is sixty feet square, with a door in the centre of each side and three large windows on each side of the door. On two sides there is a representation of the setting sun and the word 'Armageddon' inscribed below. The second storey is twenty-seven feet square with three windows on each side; and the third storey nine feet square with one window on each side."

"The corners of each of the storeys are terminated by square lanterns, with gilded mountings; and the termination of the building is a gilded ball of considerable size. The interior was filled with wooden chairs placed round sixteen pillars, in the centre of which is a square cabinet of black walnut with a door and windows on each side. There was a table in the centre of the cabinet covered with black velvet, hung with crimson merino and fringe, in which was deposited a Bible. On the four central pillars were painted the words Faith, Hope, Charity, and Love; and on the twelve others, the names of the Apostles. The central pillars seemed to support the second storey; and at the foot of each was a table covered with green cloth. The house was without ornament, being painted fawn, green and white; and had not a pulpit or place for addressing an audience. It is occupied only once a month for collecting charity; and contains 2952 panes of glass, and is lighted once a year with 116 candles."

The materials of the frame-work of the Temple were, as we have been told, prepared at a distance from the site, and run rapidly up as far as possible without noise, in imitation of the building of Solomon's Temple. By the side of the principal edifice stood a structure 100 feet by 50 feet, used for ordinary meetings on Sundays. On the first Friday in September used to be an annual feast, when the Temple was illuminated. In this was an organ built by Mr. Coates of York.

David was an illiterate mystic, as his writings shew, in which, when the drift of his maundering is made out, there is nothing new or remarkable to be discerned.

At the close of the war of 1812-13-14, he appears to have been under the impression that the Government designed to banish him as a seditious person, under c. 1. 44 Geo. III. He accordingly published a document deprecating such action. It was thus headed: "Address to thy Crown, O England, and thy great name. I write as follows to all the inhabitants thereof." In the course of it he says: "After I have written, I will leave God to judge between you and me; and also to make judges of you, whether you will receive my ministry in your land in peace, yea or nay. .. .. Ye are great indeed. I can't help that, neither do I want to; but am willing ye should remain great in the sight of God, although I am but small therein, in the things thereof. Now choose whether I should or might be your servant in these things, yea or nay. As I think, it would be a shame for a minister to be banished from your nation for preaching the gospel of peace therein. I am a man," he continues, "under the visitation of God's power in your land; and many scandalous reports are in circulation against me. The intent of the spirit of the thing is to put me to flight from your dominions, or that I should be imprisoned therein. For which cause I, as a dutiful subject, make myself known hereby unto you of great estate in the world, lest your minds should be affected and stirred up against me without a cause by your inferiors, who seek to do evil to the works of God, whenever the Almighty is trying to do you good."

In some verses of the same date as this address to the home authorities, viz., 1815, he refers to the peril h supposed himself to be in. A stanza or two will suffice as a specimen of his poetical productions, which are all of the same Sternhold and Hopkins type, with the disadvantage of great grammatical irregularity. Thus he sings: (The tone of the *ci-devant* Jack-tar is perhaps to be slightly detected.)

The powers of hell are now combin'd—
With war against me rage;
But in my God my soul's resigned—
The rock of every age, &c.

Some thou doth set in king's estate,
And some on earth must serve;
And some hath gold and silver plate,
When others almost starve, &c.

The earth doth hunger for my blood,
And Satan for my soul;
And men my flesh for daily food,
That they may me control, &c.

If God doth give what I receive
The same is due to thee;
And thou in spirit must believe
In gospel liberty, &c.

It's also mine, by George our king,
The ruler of my day;
And yet if I dishonour bring,
Cut short my feeble stay, &c.

For this is in your hearts to do,
Ye inferiors of the earth:
And it's in mine to do so too,
And stop that cursed birth, &c.

The style of the volume entitled "Impressions," which used to be sold or given away to visitors in the Temple, does not rise much above the foregoing, either in its verse or prose. What Mosheim says of Menno's books, may be said with at least equal truth of Willson's: "An excessively diffuse and rambling style, frequent and unnecessary repetitions, an irregular and confused method, with other defects of equal moment, render the perusal of the productions highly disagreeable." Nevertheless, the reduction of his solitary meditations to writing had, we may conceive, a pious operation and effect on Willson's own spirit; and the perusal of them may, in the simple-minded few who still profess to be his followers, have a like operation and effect, even when in the reading constrained, with poor monk Felix, to confess that, though believing, they do not understand.

The worthy man did not win martyrdom nor suffer exile; but lived on in great worldly prosperity here in Sharon, reverenced by his own adherents as a sort of oracle, and flattered by attentions from successive political leaders on account of the influence which he might be supposed locally to possess, down to the year 1866, when he died in peace, aged eighty-nine years and seven months.

Of Willson's periodical missionary expeditions into town, we have spoken in another connexion.

LVI.—YONGE STREET FROM THE NEWMARKET ROAD TO THE LOWER LANDING ON THE HOLLAND RIVER.

We return now to the great northern route, from which we have been deviating, and hasten on with all speed to the Landing. We place ourselves at the point on Yonge Street where we turned off to Newmarket. Proceeding onward, we saw almost immediately, on the left, the conspicuous dwelling of Mr. Irving—the Hon. Jacob Æmilius Irving, a name historical in Canada, a Paulus Æmilius Irving having been Commander-in-Chief of the Forces in British America in 1765, and also President for a time of the Province of Quebec. (This Paulus Æmilius Irving had previously taken part under General Wolfe in the capture of Quebec.) The house of his descendant, Jacob Æmilius Irving, here on Yonge Street, was known as Bonshaw, from some ancient family property in Dumfriesshire. He had been an officer in the 13th Light Dragoons, and was wounded at Waterloo. In addition to many strongly-marked English traits of character and physique, he possessed fine literary tastes and histrionic skill of a high order, favoured by the possession of a grand barytone voice. To the last, *gaudebat in equis* might be said of him. A four-in-hand, guided by himself, issuing from the gates at Bonshaw and whirling along Yonge Street into town, was a common phenomenon. He died at the Falls of Niagara in 1856. Since 1843 Mr. Irving had been a member of the Upper House of United Canada.

A little way back, ere we descended the northern slope of the Ridges we caught sight, as we have narrated, of the Holland River, or at least of some portion of the branch of it with which we are immediately concerned—issuing, "a new-born rill," from one of its fountains.

As we traversed the Quaker settlement it was again seen, a brook meandering through meadows. This was the eastern branch of the river. The main stream lies off to the west,

flowing past the modern Bradford and Lloydtown. It is at the head of the main stream that the most striking approximation of the waters of the Humber and Holland rivers is to be seen.

We arrive now at the Upper Landing, the ancient canoe-landing, and we pause for a moment. Here it was the war-parties and hunting-parties embarked and disembarked, while yet these waters were unploughed by the heavy boats of the white man.

The Iroquois from the south-side of Lake Ontario penetrated the well-peopled region of the Hurons by several routes, as we have already intimated: by the great bay of Quinté highway; by the trails whose termini on Lake Ontario were near respectively the modern Bowmanville and Port Hope; and thirdly by a track which we have virtually been following in this our long ramble from York; virtually, we say, for it was to the west of Yonge Street that the trail ran, following first the valley of the Humber and then that of the main stream of the Holland river. The route which Mr. Holland took when he penetrated from Toronto Bay to the head waters of the river which now bears his name, is marked in the great MS. map which he constructed in 1791. He passed up evidently along the water-course of the Humber.

"You can pass from Lake Frontenac, *i. e.*, Ontario," Lahontan says (ii. 23), "into Lake Huron by the river Tan-a-ou-até (the Humber), by a portage of about twenty-four mills to Lake Toronto, which by a river of the same name empties into Lake Huron," by the River Severn *i. e.*, as we should now speak

In the pre-historic period, then, hunting-parties or war-parties taking to the water here at the Upper Landing would probably be just about to penetrate the almost insular district, of which we have spoken, westward of Lake Simcoe, the Toronto region, the place of concourse, the well-peopled region. But some of them might perhaps be making for the Lake Huron country and North-west generally, by the established trail having its terminus at or near Orillia (to use the modern name).

In the days of the white man, the old Indian place of embarkation and debarkation on the Holland river, acquired the name of the Upper Canoe-landing; and hither the smaller craft continued to proceed.

Vessels of deeper draught lay at the Lower Landing, to which we now move on, about a mile and a half further down the stream. Here the river was about twenty-five yards wide, the banks low and bordered by a woody marsh, in which the tamarac or larch was a conspicuous tree.

In a cleared space on the right, at the point where Yonge Street struck the stream, there were some long low buildings of log with strong shutters on the windows, usually closed. These were the Government depositories of naval and military stores, and Indian presents, on their way to Penetanguishene. The cluster of buildings here was once known as Fort Gwillimbury. Thus we have it written in the old *Gazetteer* of 1799: "It is thirty miles from York to Holland river, at the Pine Fort called Gwillimbury, where the road ends."

Galt, in his Autobiography, speaks of this spot. He travelled from York to Newmarket in one day. This was in 1827. "Then next morning," he says, "we went forward to a place on the Holland river, called Holland's Landing, an open space which the Indians and fur-traders were in the habit of frequenting. It presented to me," he adds, "something of a Scottish aspect in the style of the cottages; but instead of mountains the environs were covered with trees. We embarked at this place." He was on his way to Goderich at the time, viâ Penetanguishene.

The river Holland, at which we have so long been labouring to arrive, had its name from a former surveyor-general of the Province of Quebec, prior to the setting-off of the Province of Upper Canada—Major S. Holland. In the *Upper Canada Gazette* of Feb. 13, 1802, we have an obituary notice of this official personage. His history also, it will be observed, was mixed up with that of General Wolfe. "Died," the obituary says, "on the 28th instant (that is, on the 28th of December, 1801, the article being copied from the *Quebec Gazette* of the 31st of the preceding December), of a lingering illness, which he bore for many years with Christian patience and resignation, Major S. Holland. He had been in his time," the brief memoir proceeds to say, "an intrepid, active, and intelligent officer, never making difficulties, however arduous the duty he was employed in. He was an excellent field-engineer, in which capacity he was employed in the year 1758 at the seige of Louisbourg in the detachment of the army under General Wolfe, who after by his silencing the batteries that opposed our entrance into

the harbour from his own, and setting fire to three ships of the line, and obliging the remainder in a disabled state to haul out of cannon shot, that great officer was enabled by a rapid and unexpected movement to take post within four hundred yards of the town, from whence Major Holland, under his directions, carried on the approaches, destroyed the defences of the town, and making a practicable breach, obliged the enemy to capitulate. He distinguished himself also at the conquest of Quebec in 1759, and was made honourable mention of in Gen. Wolfe's will as a legatee. He also distinguished himself in the defence of Quebec in 1760, after General Murray's unsuccessful attack on the enemy.—After the peace he was appointed Surveyor-General of this Province, and was usefully employed in surveying the American coasts, from which survey those draughts published some years since by Major Debarres have been principally taken."

Major Holland was succeeded in the Surveyor-generalship of Lower Canada by a nephew—the distinguished Colonel Joseph Bouchette. In 1791 Major Holland constructed a map of the British Province of Quebec, on the scale of six inches to the square mile. It exists in MS. in the Crown Land Office of Ontario. It is a magnificent map. On it, Lake Simcoe is left undefined on one side, not having been explored in 1791.

It was in 1832 that the project of a steamer for the Holland river and Lake Simcoe was mooted. We give a document relating to this undertaking which we find in the *Courier* of Feb. 29, in that year, published at York. The names of those who were willing to embark, however moderately, in the enterprise are of interest. It will be observed that the expenditure contemplated was not enormous. To modern speculators in any direction, what a bagatelle seems the sum of £2000!

"Steamboat on Lake Simcoe:" thus runs an advertisement in the *Courier* of Feb. 29, 1832. "Persons who feel interested in the success of this undertaking, are respectfully informed that Capt. McKenzie, late of the *Alciope*, who has himself offered to subscribe one-fourth of the sum required to build the proposed steamboat, is now at Buffalo for the purpose of purchasing an Engine, to be delivered at Holland Landing during the present winter. Capt. McKenzie, who visited Lake Simcoe last summer, is of opinion that a boat of sufficient size and power for the business of the Lake can be built for £1250. In order, however, to ensure success, it is proposed that stock to the amount of £2000 should be subscribed; and it is hoped that this sum will be raised without delay, in order that the necessary steps may be taken, on the return of Capt. McKenzie, to commence building the boat with the view to its completion by the opening of the navigation.—The shares are Twelve Pounds ten shillings each, payable to persons chosen by the Stockholders. The following shares have been already taken up, viz.: The Hon. Peter Robinson, 8 shares; F. Hewson, 1; Edw. O'Brien, 2; W. B. Robinson, 4; W. R. Raines, 4; J. O. Bouchier, 2; Wm. Johnson, 2; John Cummer, 1; T. Mossington, 2; A. M. Raines, 1; Robert Clark, 1; Robert Johnston, 1; M. Mossington, 1; B. Jefferson, 1; J. M. Jackson, 1; R. Oliver, 1; Wm. Turner, 2; L. Cameron, 1; F. Osborne, 2; J. Graham, 1; J. White, 1; S. H. Farnsworth, 1; Andrew Mitchell, 5; Murray, Newbigging and Co., 2; Capt. Creighton, 2; Capt. McKenzie, 40; Canada Company, 8; J. F. Smith, 2; John Powell, 1; Grant Powell, 2; A. Smalley, 1; Samuel P. Jarvis, 1; James E. Small, 1; R. W. Parker, 1; D. Cameron, 1; Capt. Castle, 79th Regt., 8; James Doyle, 2; Francis Phelps, East Gwillimbury, 1; G. Lount, West Gwillimbury, 1; Samuel Lount, West Gwillimbury, 1; George Playter, Whitchurch, 1; Joseph Hewett, 1; Thomas A. Jebb, 2; Charles S. Monck, Haytesbury, 1; G. Ridout, 2; T. G. Ridout, 1; Thomas Radenhurst, 1; Major Barwick, 2; Capt. W. Campbell, 2; C. C. Small, 1; J. Ketchum, 1; Capt. Davies, 2; Lieut. Carthew, 2; Capt. Ross, 1; C. McVittie, 1; Lieut. Adams, 1; S. Washburn, 2; J. C. Godwin, 1; F. T. Billings, 2; Thorne and Parsons, 2; James Pearson, 1; R. Mason, 2; Wm. Laughton, 2; Wm. Ware, 1; A. H. Tonge, 1; Sheldon, Dutcher and Co., 1; Jabez Barber, 1; R. W. Prentice, 1; T. Bell, 1; Lucius O'Brien, 1;—Total, 162 shares. Persons who are desirous of taking shares in this boat are respectfully informed that the subscription paper is lying at the Store of Messrs. Murray, Newbigging and Co., where they can have an opportunity of entering their names. York, 21st Dec., 1831."

The movement here initiated resulted in the steamer *Simcoe*, which plied for some years between the Landing and the ports of Lake Simcoe. The *Simcoe* was built at the Upper Landing, and after being launched, it was necessary to drag the boat by main force down to deep water, through the thick sediment at the bottom of the stream. During the process, while the capstan and tackle or other arrangement was being vigorously worked—instead of

the boat advancing—the land in considerable mass moved bodily towards the boat, like a cake of ice set free from the main floe. Much of the ground and marsh in the great estuary of the Holland river is said to be simply an accumulation of earthy and vegetable matter, resting on water.

The *Simcoe* was succeeded by the *Peter Robinson*, Capt. Bell; the *Beaver*, Capt. Laughton, and other steamers.

Standing on the deck of the *Beaver*, we have ourselves more than once threaded the windings of the Holland river; and we well remember how, like sentient things in a kind of agony, the broad floating leaves of the lilies along its eastern margin writhed and flapped as the waters were drawn away from under them by the powerful action of the wheels in the middle of the stream.

"The navigation of the Holland river," Capt. Bonnycastle observes in his "Canada in 1841," "is very well worth seeing, as it is a natural canal flowing through a vast marsh, and very narrow, with most serpentine convolutions, often doubling on itself. Conceive the difficulty of steering a large steamboat in such a course; yet it is done every day, in summer and autumn, by means of long poles, slackening the steam, backing, &c., though very rarely without running a little way into the soft ground of the swamp. The motion of the paddles has, however, in the course of years, widened the channel, and prevented the growth of flags and weeds." We have been told that in the bed of the Holland river, near its mouth, solid bottom was not reached with a sounding-line of 90 feet.

LVII.—YONGE STREET FROM HOLLAND RIVER TO PENETANGUISHENE.

To render our narrative complete, we give in a few parting words some of the early accounts of the route from the Landing, northward as far as Penetanguishene, which, after the breaking up of the establishment on Drummond's island, was for some years the most remote station in Upper Canada where the naval and military power of England was visibly represented.

"After leaving Gwillimbury [i.e., the Landing]," says the *Gazetteer* of 1799, "you enter the Holland river and pass into Lake Simcoe, by the head of Cook's bay, to the westward of which are oak-plains, where the Indians cultivate corn; and on the east is a tract of good land. A few small islands shew themselves as the lake opens, of which Darling's island in the eastern part, is the most considerable. To the westward is a large deep bay, called Kempenfelt's bay, from the head of which is a short carrying-place to the river Nottawasaga, which empties itself into the Iroquois bay, in Lake Huron. In the north end of the lake, near the Narrows leading to a small lake is Francis island, between which and the north shore vessels may lie in safety."

It will be proper to make one or two remarks in relation to the proper names here used, which have not in every case been retained.

Cook's bay, it will be of interest to remember, had its name from the great circumnavigator. Kempenfelt's bay recalls the name of the admiral who went down in the Royal George "with twice four hundred men." Darling's island was intended to preserve the name of Gen. Darling, a friend and associate of the first governor; and Francis island bore the name of the same governor's eldest son. Canise island retains its name. The name of another island in this lake, "parallel to Darling's island," is elsewhere given in the *Gazetteer* as Pilkington's island—a compliment to Gen. Pilkington, a distinguished engineer officer. Darling's island, at the present day, is, we believe, known as Snake island: and Francis island and Pilkington's island by other names. Iroquois bay is the same as Nottawasaga bay: the interpretation, in fact, of the term "Nottawasaga," which is the "estuary of the Nodoway"—the great indentation whence often issued on marauding expeditions the canoes of the Nodoway—so the Ochibways called the Iroquois. Lake Simcoe itself, the *Gazetteer* of 1799 informs us, was so named by its first explorer, not in commemoration of himself, but of his father. "Lake Simcoe," we read in a note at p. 138 of the work just named, was "so named by Lieut.-Governor Simcoe in respect to his father, the late Capt. Simcoe of the Royal Navy, who died in the River St. Lawrence on the expedition to Quebec in 1759. In the year 1755, this able officer," the *Gazetteer* adds, "had furnished Government with the plan of operations against Quebec, which then took place. At the time of his death, Capt. Cook, the celebrated circumnavigator, was master of his ship the *Pembroke*." We here see the link of association which led to the application of the great circumnavigator's name to the bay into which the Holland river discharges itself. The Holland itself also, as we have already heard, had its name from a companion of Gen. Wolfe.

We have on this continent no "old poetic mountains," no old poetic objects of any description, natural or artificial, to "breathe enchantment all around." It is all the more fitting, therefore, that we should make the most of the historic memories which, even at second hand, cling to our Canadian local names, here and there.

The old *Gazetteer* next goes on to inform us that "from the bay west of Francis island there is a good path and a short portage into a small lake: this is the nearest way to Lake Huron. The river which falls from Lake Simcoe into Matchedash bay, called the Matchedash river, making a more circuitous passage to the northward and westward"—and Matchedash bay opens out, it afterwards states—"into a larger basin called Gloucester or Sturgeon bay, in the chops of which lies Prince William Henry's island, open to Lake Huron." It is noted also that on a peninsula in this basin some French ruins are still extant: and then it says, "between two larger promontories is the harbour of Penetanguishene, around which is good land for settlement." "Penetanguishene," it is finally added, "has been discovered to be a very excellent harbour."

Again some annotations on names will not be out of place.

Matchedash bay is now Sturgeon bay, and Matchedash river, the river Severn. Both bay and river have a peculiar interest for the people of Toronto, as being respectively the Toronto bay and Toronto river of the old French period. "To the north-east of the French river," Lahontan says (ii. 19), "you see Toronto bay, in which a small lake of the same name empties itself by a river not navigable on account of its rapids." (He elsewhere says this river also bore the name of the lake—Toronto.) The Duke of Gloucester was intended to be complimented in the name Gloucester bay. Prince William Henry's island has not retained its name. When it was imposed, the visit of that prince, afterwards the Duke of Kent and father of the reigning Queen, to Upper Canada, was a recent event.—The French ruins spoken of are the ruins of Fort St. Marie near the mouth of the river Wye—the chief mission-house of the Jesuits, abandoned in 1649, still visible.

The "good path" and "nearest way to Lake Huron," from the bay west of Francis island, indicates the well-known trail by Coldwater, which was long the chief route to Penetanguishene; and the bay itself, west of Francis island, is the bay known in later times as Shingle bay. In 1834 an attempt was made to found a town at Shingle bay in connexion with the road to Penetanguishene. In a *Courier* of 1834, we have the announcement: "New Town of Innisfallen. Shortly will be offered for sale several building lots in the above new Town, beautifully situated on Shingle Bay, Lake Simcoe. This being the landing-place for the trade to Penetanguishene and the northern townships," the advertisement goes on to say, "persons inclined to speculate in trade or business of any description will find this a peculiarly valuable situation, as the townships are settled with persons of respectability and capital. It will command the trade to and from the lake. Further particulars can be obtained by application to Wm. Proudfoot, Esq., or from P. Handy, auctioneer, or Francis Hewson, Esq., Lake Simcoe. April 1st, 1834."

Innisfallen, however, did not mature into a town. Orillia, just within the narrows, appears to have been a site more suited to the needs or tastes of the public.

At p. 154, in the article on Yonge Street, the old *Gazetteer* of 1799 speaks again of the portage from Lake Simcoe to Lake Huron, viâ Coldwater, and calls it "a continuation of Yonge Street." It then adds the prediction, which we have once before quoted, that "the advantage would certainly be felt in the future of transporting merchandize from Oswego to York, and from thence across Yonge Street and down the waters of Lake Simcoe into Lake Huron, in preference to sending it by Lake Erie." And in the article on "Lac aux Claies," *i. e.* as we have already heard, Lake Simcoe, it is curiously stated—this is before the year 1799—that "a vessel is now building for the purpose of facilitating the communication by that route,"—but it is not said where.

A "continuation of Yonge Street" in a more perfect sense, was, at a later period, surveyed and partially opened by the military authorities, from Kempenfelt or Shanty bay near Barrie, in a direct line to Penetanguishene; but the natural growth of the forest had in a great degree filled up the track.

In 1847, however, through the instrumentality of the Commissioner of Public Works of the day, the Hon. W. B. Robinson, the highway in question, sixty-six feet in width and thirty miles in length, was thoroughly cleared out and made conveniently practicable for general travel.

This grand avenue is almost in a direct line with Yonge Street, after the traverse of Lake Simcoe from the Landing has been accomplished.

Penetanguishene, indeed, as a port, no longer requires such an approach as this. The naval and military dépôt which existed there has been abolished: and Collingwood, since it has been made the primary terminus on Lake Huron of the Northern Railway of Canada, is the place of resort for the steamers and shipping of the upper lakes.

Nevertheless, the fine highway referred to yields permanently to the inhabitants of Vespra and Oro, Flos and Medonte, Tiny and Tay, the incalculable advantage of easy communication with each other and markets to the south,—the same advantage that Yonge Street yielded to the settlers of Vaughan and Markham, King and Whitchurch, and the two townships of Gwillimbury, in the primitive era of their local history.

It is, however, not improbable that Penetanguishene itself will again acquire importance when hereafter properly connected with our railway system, now so surely advancing to the north shore of Lake Huron: thence to push on to the North-West.

Dr. Thomas Rolph, in his Statistical Account of Upper Canada, appended to his book on the West Indies and United States, spoke in 1836 of the region which we have now reached, thus: "The country about Penetanguishene on Lake Huron is remarkably healthy: the winter roads to it, crossing Lake Simcoe, excellent. In the summer months," he says, "it is delightful to persons who are pleased and entertained by the wild grandeur and simplicity of nature. The pure and transparent waters of the beautiful bay, and the verdant foliage of the vast woods on the east side of the harbour, form a very picturesque scene."

Capt. Bonnycastle visited Penetanguishene in 1841. He was present at one of the periodical distributions of government presents to the Indians. A great concourse of the native people, from far and near, were assembled on the occasion. Under such circumstances, Penetanguishene and its surroundings must have presented a peculiarly interesting appearance.

"I happened to be at Penetanguishene," Capt. Bonnycastle says, "when the unfortunate Pou-tah-wah-tamies and nearly two thousand other Indians arrived there, the latter to receive their annual gifts, the former to implore protection. [They had been recently removed from their lands in the United States by the U. S. authorities.] I had never seen the wild and heathen Indians before," the Captain observes, "and shall never forget the impression their appearance, on an August evening, with everything beautiful in the scene around, made upon me. To do honour to the commandant of the British port and his guests, these warlike savages selected for the conference a sloping green field in front of his house whose base was washed by the waters of the Huron, which exhibited the lovely expanse of the basin, with its high and woody background, and the single sparkling islet in the middle. No spot could have been imagined more suitable. Behind it rose the high hill which, cleared of timber, is dotted here and there with the neat dwellings of the military residents." He then describes the dresses of the Indians, their painted faces, their war-dances, &c.

"The garrison," he says, "is three miles from the village, and is always called the Establishment; and in the forest between the two places is a new church built of wood, very small, but sufficient for the Established Church, as it is sometimes called, of that portion of Canada. A clergyman is constantly stationed here for the army, navy, and civilians."

In regard to the provisions supplied to the soldiers and others, Capt. Bonnycastle has the following remarks: "A farmer [Mr. Mairs, as we presume] on the Penetanguishene road has introduced English breeds of cattle and sheep of the best kind. He was, and perhaps still is," he says, "the contractor for the troops, and his stock is well worth seeing. Thus the garrison is constantly supplied with finer meat than any other station in Canada, although more out of the world and in the wilderness, than any other; and, as fish is plentiful, the soldiers and sailors of Queen Victoria in the Bay of the White Rolling Sand live well." Penetanguishene means "the place of the falling sands:" the reference being to a remarkable sandy cliff which has been crumbling away from time immemorial, on the western side of the entrance to the harbour.

We have a notice of Penetanguishene in 1846, in a volume of Travels in Canada, by the Rev. A. W. H. Rose, published in 1849. "Penetanguishene," the writer says, "is situated at the bottom of a bay extremely shallow on one side, and is a small military and naval station, the latter force consisting of two iron war-steamers, of about sixty-horse power each. There is said to be a nice little society in this (until lately) out-of-the-way station of Upper Canada.

The probability is, however," remarks the same writer, "that it will, as a naval and military depôt, have to be eventually shifted to Owen's Sound, where there is a military reserve specially retained in the survey, as, from the number of shoals about Penetanguishene, the islands, &c., the harbour is said generally to close up with ice three weeks earlier, and to continue shut three weeks later than at the Sound."

A diagram in the *Canadian Journal* (i. 225), illustrating a paper by Mr. Sandford Fleming, shews the remarkable terraced character of the high banks of the harbour of Penetanguishene. "There are appearances in various parts of this region," Mr. Fleming says, "that lead us to infer that the waters of Lake Huron, like those of Ontario, formerly stood at higher levels than they at present occupy. Parallel terraces and ridges of sand and gravel can be traced at different places winding round the heads of bays and points of high land with perfect horizontality, and resembling in every respect the present lake beaches. One of them particularly strikes the attention in the bay of Penetanguishene, at a height of about seventy feet above the level of the lake. It can be seen distinctly on either side from the water, or by a spectator standing on one bank while the sun shines obliquely on the other, so as to throw the deeper parts of the terrace in shadow." Mr. Fleming then gives a section "sketched from a cutting a little below Jeffery's Tavern in the village of Penetanguishene, serving to shew the manner in which the soil has been removed from the side hill and deposited in a position formerly under water by the continued mechanical action of the waves. Not only does the peculiar stratification of the lower part of the terrace confirm the supposition that it was deposited on the shore of the ancient lake, but the fact that such excavations have been made in this land-locked position, where the waves could never have had much force, goes far to prove that the lake stood for a long period at this high level." (From the successive subsidences here spoken of by Mr. Fleming, the island known as the Giant's Tomb, in the entrance to Georgian Bay has its peculiar appearance, viz., that of a colossal grave elevated on a high platform or pedestal.)

In 1827, John Galt, the well-known writer, had been at Penetanguishene. He was on his way from York to make an exploration of the lake Huron west of the Canada Company's Huron tract, from Cabot's head in the north to the Riviere aux Sables in the south. For this purpose, a Government vessel, the *Bee*, lying in Penetanguishene harbour, had been placed at his disposal. In his Autobiography he gives the following incidents of his journey from the shore of Kempenfelt bay. "About half-way to Penetanguishene," he says, "we were compelled by the weather to take shelter in a farm house, and a thunderstorm coming on obliged us to remain all night. The house itself was not inferior to a common Scottish cottage, but it was rendered odious by the landlady, who was, all the time we stayed, 'drunk as a sow, Huncamunca.' Next day we proceeded," he continues, "to the military station and dockyard of Penetanguishene by a path through the woods, which, to the honour of the late Mr. Wilberforce, bears his name. Along it are settled several negro families. As I walked part of the way," Galt says, "I went into a cottage, pleasantly situated on a rising ground, and found it inhabited by a crow-like flock of negro children. The mother was busy with them, and the father, a good-natured looking fellow, told me that they were very comfortable, but had not yet made any great progress in clearing the land, as his children were still too young to assist. We reached Penetanguishene," Galt then says, "the remotest and most inland dockyard that owns obedience to the 'meteor-flag of England,' where, by the orders of the Admiralty, his Majesty's gun-boat the *Bee* was placed at my disposal. By the by," he adds, "the letter from the Admiralty was a curious specimen of the geographical knowledge which then prevailed there, inasmuch as it mentioned that the vessel was to go with me on Lake Huron in Lower Canada. In the village of Penetanguishene," he then informs us, "there is no tavern. We were therefore obliged to billet ourselves on the officer stationed there, of whose hospitality and endeavour to make the time pass pleasantly till he had the *Bee* ready for the lake, I shall ever retain a pleasant remembrance." He then describes his voyage in the little gun-boat as far as Detroit, and his examination of the river subsequently called the Maitland, and the site where Goderich was afterwards built.

Since 1840, the Rev. Geo. Hallen has been a resident clergyman at Penetanguishene. From him have been obtained the following particulars of detachments of military stationed from time to time at that post. In 1838 a detachment of the 34th regiment, Lieut. Hutton commanding. In 1838 also, there were some incorporated Militia there under Col. Davis. In

1840, a detachment of the 93rd Highlanders, under Lieut. Hay. In 1844, a detachment of the 84th regiment, under Lieut. West. In 1846, a detachment of the Royal Canadian Rifles, under Lieut. Black. In 1850, a detachment of the Royal Canadian Rifles, under Lieut. Fitzgerald. In 1851, a detachment of the Royal Canadian Rifles, under Lieut. Moffatt. In 1851, some of the Enrolled Pensioners, under Capt. Hodgetts.

In regard to the Navy. In 1843, June 8th, the *Minos*, a large gun-boat, in charge of Mr. Hatch and three men, arrived to be laid up. In the same year, the steamer *Experiment*, Lieut. Boxer, was stationed there. In 1847, the same steamer, but commanded by Lieut. Harper. In 1847 also, the steamer *Mohawk*, commanded by Lieut. Tyssen. In 1850, the same steamer, but commanded by Lieut. Herbert. The place was also visited by Capt. Ross, R.N., when on his way to the North Seas; and by Lord Morpeth, Lord Prudhoe, and Sir Henry Harte, (the two latter Captains in the Navy), on their way to or from the Manitoulin islands.

From Poulett Scrope's Life of Lord Sydenham, we learn that Penetanguishene was visited by that Governor of Canada in 1840. "From Toronto across Lake Simcoe to Penetanguishene on Lake Huron again, and back to Toronto, which I left again last night for the Bay of Quinté." —*Private Letter*, p. 190.

The following account of the removal of the British post from Drummond's island to Penetanguishene in 1828, has been also derived from the Rev. Mr. Hallen, who gathered the particulars from the lips of Mr. John Smith, aged 80, still living (1872) near Penetanguishene, formerly employed in the Ordinance Department at Quebec, and then as Commissariat Issuer at Drummond's island. "Mr. John Smith and his wife remained on the island till the 14th of November, 1828, when it was given up to the Americans. Lieut. Carson commanding a detachment of the 68th regiment was there at the time; and Mr. Smith well remembers Lieut. Carson giving up the keys to the American officers, and that 'they shook hands quite friendly.' The Government sent the brig *Wellington* to take away the British from the island, but it was too small, and they were obliged in addition to hire an American vessel. Mr. Keating was at that time Fort adjutant at the island, and Mr. Rawson, barrack master. Smith arrived at Penetanguishene as a Commissariat Issuer on the 20th or 21st November, 1828. He does not remember any vessels at Drummond island. He says that Commodore Barrie came up in the *Bullfrog*; and that the gossip of the island was, that he was the cause of its being given up to the Americans. Mr. Keating, the Fort adjutant, was afterwards Fort adjutant at Penetanguishene, where he arrived in the spring of 1829, having been detained at Amherstburgh. He died in the year 1849. Mr. Smith said that, as far as he could recollect, the detachments stationed on the island were, of the 71st Regiment, under Lieut. Impett; of the 79th, under Lieut. Matthews; of the 24th, under Lieut. James; of the 15th, under Lieut. Ingall. (The last-named officer lived afterwards at Penetanguishene.) In 1828, there were at Penetanguishene 20 or 30 Marines, under the command of Lieut. Woodin, R.N. In regard to the four gun-boats which are sunk in the harbour, Mr. Smith said they were sunk there before 1828. He remembers the name of only one of them, the *Tecumseh*." Mr. Hallen remarks: "The account I heard of these gun-boats when I came to Penetanguishene was that they were brought here, I think, from Nottawasaga bay after the American war and were sunk to prevent their rotting. Vessels must have been built at Penetanguishene," Mr. H. adds, "as I remember a place on the Lake Shore, about five miles N.W. of Penetanguishene, being pointed out to me as the 'Navy Yard.' Many of the logs were still there."

The *Bee*, which conveyed Mr. Galt when on his voyage of explorations along the western coast of Lake Huron, was sold by public auction in 1832. In that year the first great reduction of the naval and military establishment at Penetanguishene took place. Step by step the process went on until the ancient dépôt was finally extinguished, and in 1859 the stone barracks were converted into a Public Reformatory. The enumeration of the stores disposed of by public vendue, on Thursday the 15th of March, 1830, and six following days, at Penetanguishene, will not be without pathos. At all events, those who have, at any time, made boats and the appurtenances of boats one of their hobbies, will not dislike to read the homely names of the articles then brought to the hammer. It will be observed that no mention is made of a certain memorable anchor laboriously dragged from York as far as the Landing *en route* to Penetanguishene; but taken no further, becoming, when half embedded in the earth there, an object of perpetual wonderment to beholders: a thing too ponderous to be conveniently handled and removed by an ordinary purchaser, let the amount paid for it be ever so trifling.

The following, then, were the miscellaneous articles belonging to the Crown advertised to be sold to the highest bidder on the 15th and following days of March, 1832, at Penetanguishene, and so, we may conclude, disposed of accordingly:—The *Tecumseh*, schooner, 175 tons. The *Newask*, brigantine, 175 tons. The *Bee*, gunboat, 41 tons. The *Mosquito*, gunboat, 31 tons. The *Wasp*, gunboat, 41 tons. Batteaux, three in number. Thirty-two feet cutter. Two thirty-two feet gigs and their furniture. One whale boat. One jolly boat. One nineteen feet gig. Twenty-two pounds old bunting. Canvas, mildewed slightly, 366 yards. Canvas, of all sorts, cut from frigate sails, 2170 yards. Old canvas, 491 yards. Packing cases, 23. Iron casks, 12. Iron bound casks, 8. Wood bound casks, 24. Chests, common, 2. Chests, top, 2. Cordage, worn, 988 fathoms. Cordage, in rounding, 318 fathoms. Cordage, in junk, 28 cwt. 20 lbs. Cordage, in paper stuff, 1 cwt. 3 qrs. 1 lb. Covers, hammock, 5. Iron, old wrought, 12 cwt. 3 qrs. 16½ lbs. Rigging, brigantine, standing, complete, 1 set. Running, in part, 1 set. Rigging, schooner, standing and running, complete, 1 set. Rigging, Durham boats, standing and running, in part, 2 sets. Rigging, boats, standing, worn, 1 set. Sails for a 32 gun ship, 1 set brigantine sails, 1 set schooner sails, 1 set Durham boat sails, 18 in number boat sails, 18 in number unserviceable stores. Axes, felling, 8. Bellows, camp forge, 2 pairs. Blocks, single, 11 inch, 1. Blocks, double, 10 inch, 1. Brushes, tar, 15. Buckets, leather, 14. Chisels, of sorts, 12. Compass glasses, 1. Cordage, 552 fathoms. Glass, broken, 16 panes. Hammocks, 16. Locks, stock, 1. Mallets, caulking, 1. Oars, fir, 7. Paint, white, 1 qr. 2 lbs. Paint, yellow, 2 qrs. 18 lbs. Planes, 10 in number. Punts, boats, 1. Saws, cross-cut, 5. Saws, hand, 6. Saws, dove-tail, 1. Saws, rip, 3. Spout, for pump, 1. Sweeps, 4. Shovels, 9. Twine, fine, 3½ lbs. Twine, ordinary, 17½ lbs. Seines, 1. The document which supplies us with the foregoing list announces that, "the stores will be put up in convenient lots, and that a deposit of 25 per cent. will be required at the time of sale, and the remainder of the purchase money previous to the removal of the articles, for which a reasonable time will be allowed." The whole is signed—Wm. Henry Woodin, Lieutenant commanding, June 18th, 1832.

We here bring to a close our Collections and Recollections in regard to Yonge Street. That our narrative might be the more complete, we have given a notice of the ancient terminus of that great thoroughfare, on Lake Huron. It will be seen that in Penetanguishene and its environs, Toronto has a place and a neighbourhood at the north abounding with interesting memories almost as richly as Niagara itself and that vicinity, at its south: memories intimately associated with its own history, not alone before the present century began, but also before even the preceding century began, taking into view, that is, the local history of this part of Canada prior to the acquisition of the country by the English.

From remote Penetanguishene, dismantled and abolished in a naval and military sense, our thoughts naturally turn to more conspicuous places that have in our day successively undergone the same process: to Kingston, to Niagara, to Montreal, to our own Fort, here at Toronto, and, finally, in 1871, to Quebec. The 8th of November, 1871, will be a date noted in future histories. On that day, the Ehrenbreitstein of the St. Lawrence, symbol for a hundred years and more of British power on the northern half of the North American continent, was voluntarily evacuated, in accordance with a deliberate public policy. The 60th Regiment, it is singular to add, which on the 8th of November, 1871, marched forth from the gates of the citadel of Quebec, was a regiment that was present on the heights of Abraham in 1759, and helped to capture the fortress which it now peacefully surrendered. Is the day approaching when artistic tourists will be seen sketching, at Point Levi, the bold Rock in front of them for the sake of the ruins at its summit, not picturesque probably, but for ever famed in story?

[The Collections and Recollections in regard to Toronto of Old terminate here. Revised and corrected, they are on the point of being reproduced in book form, with portraits on steel of the founder of the city, Governor Simcoe, and the first Chief Justice of Upper Canada, the Hon. W. Osgoode. The section on the early Marine of the Harbour will be given in the forthcoming volume. By an oversight, it will seem as if there were one or two gaps in the numbering of the Sections of this series in the *Journal*. There are, however, no gaps. No sections have been omitted.]

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—DECEMBER, 1872.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vaponr.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	MEAN		6 A.M.	2 P.M.	10 P.M	M'N	6 A.M.	2 P.M	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 PM	10 P.M.	Result'.	MEAN		
					°	°	°	°	°												°							
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S	S	S 24 W	9.2	15.6	9.6	9.46	11.68	...	1.5
2	29.203	29.094	29.262	29.1877	31.9	36.6	30.4	33.00	+ 2.95	.165	.204	.139	.169	92	94	82	89	S	S W	W	S 59 W	5.6	5.2	16.8	6.95	8.56	0.260	1.6
3	.355	.489	.623	.5143	31.5	32.6	30.1	31.20	+ 1.65	.155	.158	.150	.154	88	85	89	88	W	W	W	S 78 W	23.8	14.0	14.2	15.49	15.68	...	0.2
4	.780	.820	.810	.8033	27.2	28.6	24.3	26.68	— 2.42	.132	.115	.097	.112	89	74	74	77	W	W	W	S 88 W	7.8	12.0	3.6	8.75	8.82	...	Inap.
5	.638	.604	.706	.6532	31.9	32.9	30.4	31.80	+ 3.17	.165	.132	.123	.136	92	69	72	75	S W	W	S W	S 71 W	12.2	17.2	13.0	10.19	10.92	...	...
6	.734	.890	.939	.8703	29.3	20.0	25.4	27.05	— 1.12	.144	.111	.118	.118	89	70	86	80	N	W	Calm.	N 67 W	13.4	11.0	0.0	7.17	8.24	..	0.3
7	.833	.690	.378	.5967	25.0	31.1	33.7	29.78	+ 2.07	.116	.102	.179	.136	86	58	95	81	W	S W	S W	S 47 W	2.8	11.0	18.0	8.70	9.11	.010	0.1
8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S W	W	N W	S 77 W	9.6	10.0	27.4	9.99	12.79	.120	0.1
9	.379	.487	.665	.5305	8.8	10.6	8.4	9.02	—17.85	.056	.053	.061	.056	87	75	96	87	N W	N W	N W	N 34 W	18.9	22.0	14.2	16.35	16.47	...	0.1
10	.732	.779	.901	.8323	5.2	19.2	18.0	13.92	—12.53	.052	.069	.069	.064	95	66	71	78	Calm.	W	N W	N 68 W	0.0	13.6	4.2	7.53	7.76	...	...
11	.957	.971	30.010	.9872	14.9	22.8	12.0	15.30	—10.75	.075	.081	.054	.065	87	66	73	74	W	N W	Calm.	N 56 W	1.0	13.8	0.6	4.87	5.18	...	...
12	.962	.829	29.751	.8422	7.3	22.8	23.6	17.78	— 7.87	.055	.094	.111	.087	93	78	88	86	N	Calm.	S W	S 79 W	3.4	0.0	6.8	1.71	2.80	...	...
13	.661	.447	.464	.5235	23.9	26.4	29.0	26.43	+ 1.17	.109	.113	.126	.118	84	79	78	82	S W	W	W	S 65 W	9.4	10.2	14.4	11.08	11.21	...	0.2
14	.631	.674	.364	.5448	29.3	32.6	35.1	32.45	+ 7.57	.144	.106	.143	.130	89	57	69	70	S W	S W	S W	S 53 W	7.5	2.4	18.8	7.44	8.72	...	Inap.
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	W	W	N 81 W	23.5	15.6	7.5	13.11	14.38	...	Inap.
16	.689	.545	.604	.6155	14.6	24.6	17.1	18.52	— 5.72	.075	.094	.068	.079	89	70	72	78	Calm.	S W	W	S 82 W	0.0	2.8	3.6	1.95	2.03	...	...
17	.758	.826	.873	.8323	12.4	21.8	16.7	16.95	— 6.95	.062	.072	.072	.069	80	63	78	75	N W	W	Calm.	N 88 W	1.2	4.5	0.0	3.49	3.73	...	...
18	.729	.506	.791	.6758	19.6	23.6	16.3	19.95	— 3.65	.085	.113	.070	.089	80	88	77	82	N E	N	W	N 22 W	3.0	8.4	2.8	3.88	4.72	...	0.4
19	.963	.999	.711	.8622	16.0	19.2	25.0	19.67	— 3.67	.074	.075	.123	.092	83	72	91	84	W	Calm.	E	S 73 W	10.3	0.0	12.0	2.48	7.21	...	2.0
20	.132	.309	.621	.3720	30.4	29.3	20.0	26.45	+ 3.38	.160	.123	.080	.120	95	75	75	80	E	W	W	S 62 W	7.5	21.0	2.4	2.96	12.82	...	5.5
21	.759	.653	.630	.6898	10.2	15.6	7.7	9.67	—13.18	.052	.073	.051	.055	75	83	84	80	W	W	W	S 79 W	8.9	5.4	31.9	10.25	10.43	...	0.2
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	S W	S 69 W	12.0	8.2	21.0	11.36	12.34	...	0.2
23	.374	.531	.854	.6098	10.6	8.1	-1.0	5.42	—17.00	.064	.047	.036	.047	92	76	85	83	W	W	W	S 83 W	8.6	31.6	20.4	18.21	18.54	...	1.2
24	30.033	30.141	30.173	30.1267	-4.2	-1.0	-7.7	-4.65	—26.87	.031	.035	.030	.030	82	84	92	84	N	Calm.	N	N 46 W	2.8	0.0	5.6	5.28	7.08	...	...
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	N E	N E	N 46 E	5.5	15.0	18.6	11.98	12.21	...	15.0
26	29.655	29.576	29.606	29.6100	-0.2	1.6	1.6	0.73	—21.13	.043	.044	.044	.043	97	94	94	94	N E	N	N W	N 29 E	16.8	12.0	9.0	13.86	15.11	...	8.0
27	.554	.474	.551	.5282	-6.2	9.9	8.0	3.83	—17.90	.028	.054	.053	.046	81	81	88	87	N W	N	N E	N 42 W	0.5	12.8	4.6	4.38	5.84	...	0.1
28	.641	.693	.787	.7110	10.9	20.0	15.6	15.63	— 5.98	.066	.086	.070	.075	94	80	76	84	N W	S W	W	S 74 W	3.8	15.2	8.0	7.29	7.79	...	0.2
29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	Calm.	S 85 W	8.6	2.0	0.0	4.21	4.28	...	0.2
30	30.074	30.009	.814	.9480	7.3	20.3	18.5	15.55	— 5.90	.055	.091	.091	.078	93	82	91	87	N W	Calm.	N E	N 1 W	4.4	0.0	2.5	0.86	1.58	...	0.5
31	29.668	29.755	.920	.7938	21.0	28.2	25.4	24.65	+ 3.25	.108	.136	.111	.116	95	87	81	87	N	N W	N W	N 10 W	5.2	4.0	8.5	2.70	3.31	...	0.4
	29.6758	29.6716	29.7123	29.6905	15.94	21.86	18.94	18.67	— 6.19	.091	.095	.091	.091	88	76	82	82	.....	.....	.....	.....	7.97	10.21	10.28	.....	9.00	0.390	38.0

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR DECEMBER, 1872.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.173 at 10 p.m. on 24th } Monthly range
Lowest Barometer.....29.088 at 4 p.m on 2nd } 1.085.

Self-registering Ther.
- Maximum Temperature ..... 40°0 on 8th } Monthly range
- Minimum Temperature .....—13°8 on 27th } 53°8.
- Mean Maximum Temperature .....24°53 } Mean daily range
- Mean Minimum Temperature .....10°08 } 14°45.
- Greatest daily range.....34°5 from p.m. of 8th to a.m. of 9th.
- Least daily range ..... 6°8 from a.m. to p.m. of 14th.

Warmest Day..... 2nd ... Mean Temperature.....33°00 }
Coldest Day.....24th ... Mean Temperature.....-4°65 } Difference=37°65.

Maximum Radiation
- Solar..... 107°0 on 18th } Monthly range
- Terrestrial.....—20°0 on 25th } 127°0.

Aurora observed on 2 nights, viz., 3rd and 23rd.

Possible to see Aurora on 12 nights; impossible on 19 nights.

Raining on 3 days; depth 0.390 inches; duration of fall 17.5 hours.

Snowing on 24 days; depth 38.0 inches; duration of fall 139.3 hours.

Mean of Cloudiness=0.75.

WIND.

Resultant Direction N. 87° W.; Resultant Velocity 5.51 miles.

Mean Velocity 9.06 miles per hour.

Maximum Velocity 32.6 miles, from 9.30 to 10.30 p.m. of 21st.

Most Windy day 23rd; Mean Velocity 18.54 miles per hour.

Least Windy day 30th; Mean Velocity 1.58 miles per hour.

Most Windy hour noon; Mean Velocity 11.33 miles per hour.

Least Windy hour 8 a.m.; Mean Velocity 6.80 miles per hour.

Lunar halo on 14th.

Large meteor in S at 4.50 p.m. of 11th.

It will be seen from the Comparative Table that the fall of snow during December, 1872, is the greatest in any similar month.

COMPARATIVE TABLE FOR DECEMBER.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velo'y	Mean Velocity.
	°	°	°	°	°					°		
1844	28.2	+ 2.3	48.5	1.6	46.9	6	Imp.	6	4.2	...	...	0.40 lbs
1845	21.1	— 4.8	39.7	— 2.4	42.1	2	Inap	12	4.7	...	...	0.70
1846	27.5	+ 1.6	49.2	3.9	45.3	5	1.215	9	6.0	...	...	0.57
1847	30.1	+ 4.2	49.6	0.3	49.3	7	1.185	8	6.8	...	...	0.55
1848	29.1	+ 3.2	48.8	1.1	47.7	7	2.750	7	16.5	S 83 W	1.12	5.44mls
1849	26.5	+ 0.6	40.8	— 6.5	47.3	5	0.840	12	9.6	N 82 W	2.56	6.23
1850	21.7	— 4.2	48.8	— 9.0	57.8	2	0.190	18	29.5	N 44 W	2.93	7.40
1851	21.5	— 4.4	44.0	—14.8	58.8	6	1.075	15	10.7	N 82 W	4.00	7.37
1852	31.9	+ 6.0	51.0	13.2	37.8	7	3.995	10	20.1	S 69 W	1.03	6.54
1853	25.3	— 0.6	46.4	— 8.4	54.8	4	0.625	13	22.3	N 35 W	2.39	4.98
1854	21.9	— 4.0	44.8	— 7.0	51.8	5	0.590	12	17.2	N 44 W	4.30	8.56
1855	26.8	+ 0.9	47.0	— 5.2	52.2	6	1.845	10	29.5	S 88 W	5.29	11.38
1856	22.9	— 3.0	42.2	— 9.1	51.3	6	1.790	20	16.3	S 87 W	4.62	11.56
1857	31.9	+ 6.0	46.0	4.7	41.3	7	3.205	14	9.0	N 89 W	2.50	6.84
1858	27.4	+ 1.5	45.4	4.2	41.2	11	1.657	18	10.4	N 78 W	1.66	9.36
1859	17.9	— 8.0	54.8	— 6.0	60.8	3	1.035	23	37.4	N 53 W	4.29	10.77
1860	24.0	— 1.9	39.0	— 7.0	46.0	3	1.362	21	13.5	N 62 W	4.66	10.14
1861	31.1	+ 5.2	55.2	5.5	49.7	6	0.560	8	6.8	N 72 W	3.50	7.96
1862	28.8	+ 2.9	50.1	— 3.4	53.5	5	1.945	8	10.4	N 73 W	3.17	7.58
1863	27.0	+ 1.1	53.4	— 1.5	54.9	10	2.960	17	7.1	N 41 W	1.61	9.40
1864	24.7	— 1.2	50.4	—10.4	60.8	9	2.045	18	27.1	S 82 W	4.94	9.98
1865	27.7	+ 1.8	54.2	5.7	48.5	7	1.727	11	5.2	S 81 W	3.07	7.33
1866	25.1	— 0.8	51.0	— 5.0	56.0	7	2.790	13	15.5	S 88 W	4.98	9.91
1867	21.6	— 4.3	49.5	—12.8	62.3	7	1.408	21	13.6	S 81 W	4.82	10.32
1868	22.5	— 3.4	44.2	— 3.2	47.4	1	0.005	18	15.5	N 71 W	4.05	9.80
1869	28.7	+ 2.8	45.0	6.0	39.0	10	2.590	9	7.1	S 80 W	2.31	8.44
1870	26.5	+ 0.6	45.2	— 5.8	51.0	6	2.430	16	15.9	N 89 W	5.06	11.46
1871	19.9	— 6.0	48.2	—21.0	69.2	4	0.940	20	14.2	S 70 W	6.91	11.52
1872	18.7	— 7.2	40.0	—13.8	52.8	3	0.390	24	38.0	N 87 W	5.51	9.06
Result's to 1871.	25.84	...	47.59	—3.29	50.88	5.72	1.654	13.59	14.14	N 61 W	1.91	8.76
Excess for 72.	— 7.17	...	— 7.59	— 10.51	+ 2.92	— 2.72	— 1.264	+ 10.41	+ 23.86	...	...	+ 0.30

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1872.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY

Latitude 43° 39′ 4″ North. Longitude 5h. 17m. 33s. West. Elevation above

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.
Mean temperature	22.39	20.69	19.92	40.48	51.90	63.74	70.16
Difference from average (52 years)	— 0.70	— 2.33	— 9.76	— 0.65	+ 0.27	+ 2.13	+ 2.87
Thermic anomaly (lat 43° 40′)	—10.41	—14.01	—20.18	— 9.72	— 6.20	— 0.86	+ 1.46
Highest Temperature	41.8	45.2	46.4	70.0	78.8	88.0	96.0
Lowest Temperature	— 2.5	— 3.6	— 10.8	22.7	32.0	41.8	52.2
Monthly and annual ranges	44.3	48.8	57.2	47.3	46.8	46.2	43.8
Mean maximum temperature	27.72	29.29	29.80	49.97	61.97	73.38	80.67
Mean minimum temperature	13.92	12.51	12.41	31.35	41.38	51.91	59.61
Mean daily range	13.80	16.78	17.39	18.62	20.59	21.47	21.06
Greatest daily range	33.4	34.5	36.0	37.8	36.8	30.0	29.0
Mean height of the barometer	29.5941	29.6204	29.6621	29.5758	29.5670	29.5586	29.5551
Difference from average (31 years)	—.0514	—.0047	+.0610	—.0142	—.0030	—.0155	—.0394
Highest barometer	30.193	30.231	29.965	29.970	29.976	29.871	29.774
Lowest barometer	28.986	28.997	28.789	29.091	28.941	29.154	29.317
Monthly and annual ranges	1.207	1.234	1.176	0.879	1.035	0.717	0.457
Mean humidity of the air	80	79	75	67	72	73	60
Mean elasticity of aqueous vapour	0.103	0.094	0.088	0.169	0.280	0.436	0.507
Mean of cloudiness	0.82	0.52	0.54	0.54	0.54	0.51	0.50
Difference from average	+ 0.09	—0.20	— 0.08	— 0.06	— 0.02	— 0.02	0.00
Resultant direction of the wind	S. 87° W.	N. 61° W.	N. 66° W.	N. 61° W.	N. 52° W.	N. 69° W.	N. 67° W.
" velocity of the wind	4.73	3.32	5.36	3.84	2.25	0.76	1.19
Mean velocity (miles per hour)	8.87	8.93	10.48	9.12	6.49	3.80	3.56
Difference from average (24 years)	+ 0.58	+0.30	+ 1.68	+ 0.99	— 0.25	— 1.41	— 1.43
Total amount of rain	0.220	0.350	0.700	0.910	1.934	3.148	2.297
Difference from average	—1.008	—0.544	—0.918	—1.529	—1.320	+0.170	—0.951
Number of days rain	5	5	2	9	14	8	13
Total amount of snow	3.9	7.3	16.3	0.7	...	...	...
Difference from average (29 years)	—13.59	—12.01	+ 4.08	— 1.69	— 0.07	...	...
Number of days snow	15	9	14	5	...	...	...
Number of fair days	13	16	17	18	17	22	18
Number of auroras observed	2	2	4	8	6	8	8
Possible to see aurora (No. of nights)	11	18	17	20	25	24	25
Number of thunder storms	...	...	...	...	3	3	5

REGISTER FOR THE YEAR 1872.

TORONTO, ONTARIO.

Lake Ontario 108 feet. Approximate elevation above the sea, 342 feet.

Aug.	Sept.	Oct.	Nov.	Dec.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
°	°	°	°	°	°	°	°	°	°	°	°
69.48	59.11	45.55	32.91	18.67	42.92	43.81	45.93	43.13	43.33	43.84	43.51
+ 3.40	+ 1.07	— 0.31	— 3.62	— 7.17	— 1.23	— 0.34	+ 1.78	— 1.02	— 0.82	— 0.31	— 0.64
+ 0.98	— 2.39	— 8.25	—10.29	—17.35	— 8.08	— 7.19	— 5.07	— 7.87	— 7.67	— 7.16	— 7.49
91.8	84.4	70.0	40.9	96.0	96.0	89.5	88.4	89.0	93.4	95.2	94.0
51.0	38.2	25.2	8.2	— 13.8	— 13.8	— 21.0	— 6.6	— 5.4	— 15.6	— 12.8	— 14.0
40.8	46.2	44.8	43.8	53.8	19.8	110.5	95.0	94.4	109.0	108.0	108·0
78.57	68.68	54.11	40.56	24.53	...	...	...	...	...	...	...
61.22	50.51	37.13	26.11	10.08	...	...	...	...	...	...	...
17.35	18.17	16.98	14.45	14.45	17.59	16.46	15.71	14.61	15.26	15.47	14.99
26.4	27.5	25.6	23.6	34.5	37.8	34.6	36.2	33.6	38.7	31.6	40.8
29.6142	29.5937	29.6940	29.5689	29.6905	29.6079	29.6066	29.5956	29.5970	29.6421	29.6140	29.6216
—.0073	—.0766	+.0495	—.0424	+.0413	—.0085	—.0098	—.0208	—.0194	+.0257	—.0024	+.0052
29.853	29.942	30.194	29.966	30.173	30.231	30.388	30.212	30.223	30.445	30.332	30.940
29.311	29.914	29.226	29.047	29.008	28.789	28.673	28.166	28.793	28.824	28.768	28.807
0.542	0.728	0.968	0.919	1.085	1.442	1.715	2.046	1.430	1.621	1.564	2.133
74	78	77	76	82	75	73	76	77	76	74	75
0.539	0.406	0.240	0.152	0.191	0.259	0.242	0.279	0.252	0.264	0.252	0.248
0.56	0.58	0.51	0.68	0.75	0.59	0.64	0.62	0.66	0.64	0.61	0.61
+ 0.08	+ 0.08	— 0.10	— 0.06	0.00	— 0.02	+ 0.03	+ 0.01	+ 0.05	+ 0.03	0.00	0.00
°	°	°	°	°	°	°	°	°	°	°	°
N. 51 w.	N. 79 w.	N. 18 w.	S. 85 w.	N. 87 w.	N 72 w.	N. 72 w.	N. 45 w.	N. 64 w.	N. 57 w.	N. 60 w.	N. 73 w.
1.43	1.47	2.22	5.15	5.51	2.91	2.49	1.61	2.55	1.47	2.05	2.83
3.73	5.24	4.59	7.48	9.06	6.78	8.24	7.33	7.20	7.69	7.00	7.41
— 1.55	— 0.20	— 1.61	— 0.23	+ 0.30	— 0.24	+ 1.22	+ 0.31	+ 0.18	+ 0.67	— 0.02	+ 0.39
2.405	2.526	3.288	0.420	0.390	18.588	22.771	33.898	31.182	29.408	19.041	34.209
—0.616	—1.190	+0.899	—2.557	—1.264	-10.828	—6.645	+4.482	+1.766	—0.008	-10.375	+4.793
19	16	14	7	3	115	110	116	115	103	100	126
...	...	inapp.	1.3	38.0	67.5	99.6	122.9	84.6	78.7	110.5	52.1
...	...	— 0.87	— 1.98	+23.86	—2.27	+29.83	+53.13	+14.83	+ 8.93	+40.73	—17.67
...	...	1	9	24	77	84	77	81	82	84	69
12	14	17	14	7	185	187	185	180	190	181	180
8	4	9	6	2	67	55	77	47	50	43	44
26	18	21	19	12	236	209	206	182	193	202	209
6	9	2	...	...	28	22	34	32	25	23	24

TEMPERATURE.

	1872.	Average of 32 years.	Extremes.	
	°	°	°	°
Mean temperature of the year	42.92	44.15	46.36 in '46	42.16 in '56
Warmest month	July.	July.	July, 1868.	Aug. 1860.
Mean temperature of the warmest month	70.16	67.29	75.80	64.46
Coldest month	Decem.	February.	Jan., 1857.	Feb. 19, 1848
Mean temperature of the coldest month	18.67	23.02	12.75	26.60
Difference between the temperatures of the warmest and the coldest months	51.49	44.27	...	...
Mean of deviations of monthly means from their respective averages of 32 years, signs of deviation being disregarded	2.69	2.40	3.51 in 1843.	1.32 in 1864.
Month of greatest deviation without regard to sign	March.	January.	Jan., 1857.	...
Corresponding magnitude of deviation	9.76	3.71	10.3	...
Warmest day	July 1.	...	July 14, '68.	July 31, '41
Mean temperature of the warmest day	80.80	77.68	84.50	72.75
Coldest day	Dec. 24.	...	Feb. 6, 1855. Jan. 22, 1857	Dec. 22, '42
Mean temperature of the coldest day	—4.65	—1.24	—14.38	9.57
Date of the highest temperature	July 1.	...	Aug. 24, 1854	Aug. 19, '40
Highest temperature	96.0	90.7	99.2	82.4
Date of the lowest temperature	Dec. 27	...	Jan. 10, '59.	Jan. 2, 1842.
Lowest temperature	—13.8	—12.3	—26.5	1.9
Range of the year	109.8	103.0	118.2	87.0

BAROMETER.

	1872.	Average of 31 years.	Extremes.	
Mean pressure of the year	29.6079	29.6164	29.6770 in 1849.	29.5602 in 1864.
Month of highest mean pressure	October.	September	Jan., 1849.	June 1864.
Highest mean monthly pressure	29.6940	29.6703	29.8046	29.6525
Month of lowest mean pressure	July.	May.	March, 1859.	Nov., 1849.
Lowest mean monthly pressure	29.5551	29.5700	29.4143	29.5886
Date of the highest pressure of the year	Feb. 7.	...	Jan. 8, 1866.	Jan. 14, 1870
Highest pressure	30.231	30.378	30.940	30.212
Date of the lowest pressure of the year	March 31.	...	Jan. 2, 1870.	March 17, '45
Lowest pressure	28.789	28.680	28.166	28.939
Range of the year	1.442	1.698	2.133 in 1866.	1.303 in 1845.

RELATIVE HUMIDITY.

	1872.	Average of 30 years.	Extremes.	
Mean humidity of the year	75	77	82 in 1851.	73 in 1858.
Month of greatest humidity	December.	January.	Jan. 1857.	Dec., 1858.
Greatest mean monthly humidity	82	83	89	81
Month of greatest humidity	July.	May.	Feb., 1843.	April, 1849.
Least mean monthly humidity	60	71	58	76

EXTENT OF SKY CLOUDED.

	1872.	Average of 19 years.	Extremes.	
Mean cloudiness of the year	0.59	61	0.66 in 1869	0.57 in 1856.
Most cloudy month	December.	December.	...	...
Greatest monthly mean of cloudiness	0.75	0.85	0.83	0.73
Least cloudy month	July.	August.	...	...
Lowest monthly mean of cloudiness	0.50	0.48	0.29	0.50

WIND.

	1872.	Result of 24 years.	Extremes.	
Resultant Direction	N. 72° W.	N. 61° W.	...	...
Resultant velocity in miles	2.91	1.91	...	...
Mean velocity without regard to direction	6.78	7.02	8.55 in 1860.	5.10 in 1853.
Month of greatest mean velocity	March.	March.	March, 1860.	Jan., 1848.
Greatest monthly mean velocity	10.48	8.80	12.41	5.82
Month of least mean velocity	July.	July.	Aug. 1852.	Sept., 1860.
Least monthly mean velocity	3.56	4.99	3.30	5.79
Day of greatest mean velocity	March 6.	...	Nov. 15, 1871	Dec. 2, 1848.
Greatest daily mean velocity	23.25	23.50	32.16	15.30
Day of least mean velocity	Oct. 20.	...	...	...
Least daily mean velocity	0.15	...	...	...
Hour of greatest absolute velocity	Nov. 20 n. to 1 p.m	...	Dec. 27, 1861. 9 to 10 a.m.	Mar. 14, 1853 11 a.m. to n.
Greatest velocity	37.0	40.0	46.0	25.6

RAIN.

	1872.	Average of 29 years.	Extremes.	
Total depth of rain in inches	18.588	29.416	43.555 in '72	18.588 in '72.
Number of days in which rain fell	115	109	130 in 1861.	80 in 1841.
Month in which the greatest depth of rain fell.	October.	Septemb'r.	Sept., 1843.	Sept., 1848.
Greatest depth of rain in one month	3.288	3.716	9.760	3.115
Month in which the days of rain were most frequent	August	October.	October, 1864 June, 1869.	May, 1841.
Greatest number of rainy days in one month	19	13	22	11
Day in which the greatest amount of rain fell.	June 10.	...	Sep. 14, 1843	Sept. 14, '48.
Greatest amount of rain in one day	1.551	2.071	3.455	1.000

SNOW.

	1872.	Average of 29 years	Extremes.	
Total depth of snow in inches	67.5	69.8	122.9 in 1870	38.4 in 1851.
Number of days in which snow fell	77	63	87 in 1859.	33 in 1848.
Month in which the greatest depth of snow fell.	December.	February.	March, 1870	Dec. 1851.
Greatest depth of snow in one month	38.0	19.31	62.4	10.7
Month in which the days of snow were most frequent	December.	January.	Dec., 1872.	Feb., 1848.
Greatest number of days of snow in one month.	24	14	24	8
Day in which the greatest amount of snow fell.	Dec., 25-	...	Feb. 5, 1863. March 27, '70	Jan. 10, '57.
Greatest fall of snow in one day	15.0	9.4	16.0	5.5

DIFFERENCE OF CERTAIN METEOROLOGICAL ELEMENTS FROM THEIR NORMAL VALUES FOR EACH QUARTER AND FOR THE YEAR, FROM DECEMBER, 1871, TO NOVEMBER, 1872, INCLUSIVE.

	Barometer.	Temperature	Rain.	Days Rain.	Snow.	Days Snow.	Velocity of Wind.	Clouded Sky.
		°	in.		in.			
Winter	— .0415	—3.06	— 2.290	—0.36	—25.54	—4.04	+1.25	— .02
Spring	+ .0139	—3.38	— 3.767	—3.09	+ 2.39	+5.37	+0.81	— .05
Summer	— .0207	+2.80	— 1.397	+6.62	...	...	—1.46	+ .02
Autumn	— .0232	—0.95	— 2.848	+3.41	— 2.85	+1.31	—0.68	— .02
Year	— .0177	—1.15	—10.202	+6.58	—26.00	+2.64	—0.02	— .02

PERIODICAL OR OCCASIONAL EVENTS—1872.

February 28. Crows seen.
March 30. Robins seen.
April 2. Song Sparrows.
" 5. Blue Birds arrived in neighbourhood.
" 6. Swallows seen.
" 9. Wild geese passing. First lightning. First vessel entered harbour as far as Brock Street.
" 10. Pigeons numerous. No signs of vegetation except the Chestnut buds are swelling.
" 23. Last snow of the season.
" 25. Frogs heard.—26th, Butterflies.
" 30. First thunder storm.
May 4. Last ice of season.
" 6. Maple trees in flower.
" 12. Baltimore Birds.
" 13. Last frost of season.
" 19. Humming Birds.
June 20. Fireflies seen —28th, very numerous.
" 30. Vegetation suffering very much for the want of rain.
July 30. Plover numerous.
August 26. Swallows gone.
September 3. First frost of season.
" 19. Very heavy thunder passed over this neighbourhood—large quantities of hail fell—much damage caused.
" 27. First ice of season.
October 15. First snow of season.
November 17. Very large number of shooting stars observed.
" 30. First snow storm.
December 10. Bay Frozen. Crossed on 11th.
" 19. Sleighing good.
" 25. Heavy Snow Storm from N. E.—wind in furious gusts—23 inches of snow up to night of 26th. Storm very general.

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—JANUARY, 1873.

Latitude—43° 39′4 *North. Longitude*—*5h.* 17*m.* 33*s. West. Elevation above Lake Ontario,* 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Result't	Velocity of the Wind.				Rain in inches	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	A.M.	2 P.M.	10 P.M.	MEAN		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'	6 A.M.	2 P.M.	10 P.M.		6 AM.	2 P.M.	0 P M	Res'l-tant.	MEAN		
					°	°	°	°																				
1	29.979	29.951	29.903	29.9428	21.4	25.0	22.1	22.80	+ 0.97	.097	.109	.102	.100	84	81	86	83	W	S W	N E	N 71 w	0.7	2.2	1.0	1.58	1.93	...	...
2	.827	.650	.303	.5693	25.4	27.5	33.7	29.88	+ 8.60	.118	.143	.184	.157	86	95	95	93	E.	E		N 84 E	8.0	14.8	13.4	10.79	10.87	0.470	...
3	.084	.183	.223	.1813	39.4	36.2	32.2	34 98	+13.73	.230	.167	.162	.174	95	78	89	85	S W	S E		S 54 w	18.8	13.0	24.6	13.61	14.92	.220	Inap.
4	.531	.756	.857	.7408	22.5	25.4	23.9	23.82	+ 2.58	.104	.097	.095	.098	86	72	73	77	S W	W	Calm.	S 69 w	19.0	12.8	0.0	11.95	12.17	...	Inap.
5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E	E	N W	N 57 E	19.2	10.0	22.2	8.33	14.22	...	7.4
6	.596	.859	.920	.8145	20.7	20.7	16.0	18.85	— 2.63	.085	.079	.068	.077	77	70	76	76	N W	W	W	N 65 w	15.0	5.0	5.0	11.68	11.99	...	...
7	.898	.772	.688	.7727	22.1	26.8	26.5	25.13	+ 3.92	.102	.109	.119	.109	86	74	84	80	S W	S	S E	S 16 w	9.0	10.0	5.8	8.20	9.08	...	...
8	.458	.258	.413	.3627	29.7	34.7	14.9	25.92	+ 4.70	.125	.171	.069	.113	76	85	80	77	E	S W	S W	S 32 w	5.8	18.3	7.4	6.74	10.27	...	0.2
9	.380	.445	.548	.4645	9.1	6.6	1.2	4.98	—16.25	.050	.039	.037	.041	77	67	82	76	W	W	W	S 72 w	15.0	21.2	13.6	15.97	16.00	...	...
10	.623	.670	.759	.6918	—1.3	3.4	—1.7	—0.30	—21.57	.040	.042	.041	.039	94	84	94	90	W	W	W	S 70 w	16.4	14.0	17.0	14.99	15.07	...	...
11	.794	.833	.905	.8493	—0.6	13.1	6.6	6.37	—14.95	.041	.065	.053	.053	97	83	90	90	W	W	W	S 80 w	14.0	24.5	8.8	13.91	14.07	...	...
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	E	E	S 75 E	1.8	9.5	7.0	4.44	6.01	...	...
13	.624	.396	.419	.4792	30.4	36.6	36.9	34.88	—13.47	.160	.196	.208	.188	95	90	95	92	E	S W	W	S 32 W	0.5	3.6	5.8	1.69	2.93	.020	...
14	.721	.941	30.032	.9213	29.0	24.6	24.6	24.63	+ 3.18	.126	.092	.092	.099	78	70	70	74	N W	N	S E	N 15 W	15.4	3.6	16.6	5.27	9.97	...	...
15	.949	.731	29.619	.7442	20.0	29.0	38.4	30.25	+ 8.75	.086	.147	.197	.152	80	92	85	88	E	E	S W	East.	19.0	13.8	7.2	12.34	12.97	...	Inap.
16	.416	.158	.173	.2630	40.2	42.3	32.2	35.38	+14.00	.237	.256	.162	.198	95	95	89	92	S W	N	N W	N 38 W	3.6	8.2	25.6	5.58	10.41	.400	Inap.
17	.599	.763	.825	.7362	16.4	9.1	8.6	10.57	—11.05	.076	.058	.054	.061	83	89	87	86	N W	N	N	N 26 W	19.6	14.0	14.8	15.90	16.94	...	...
18	.722	.602	.506	.6037	2.3	1.6	0.5	1.33	—20.35	.041	.042	.041	.042	86	92	94	92	N	N	W	N 6 E	13.0	10.0	6.0	8.74	9.51	...	2.0
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S W	S W	S 60 W	1.4	16.4	21.8	11.71	12.07	...	0.3
20	.417	.307	.321	.3453	20.0	24.3	28.6	24.60	+ 2.78	.100	.116	.144	.122	93	90	92	92	S W	S W	S W	S 31 W	15.0	8.4	3.2	10.32	10.37	...	3.0
21	.207	.042	.191	.1560	28.6	31.1	27.9	29.60	+ 7.72	.144	.167	.138	.151	92	96	90	92	E	E	N	N 57 E	5.0	8.0	9.0	5.17	6.85	...	4.0
22	.503	.646	.805	.6693	24.3	26.5	14.6	21.55	— 0.38	.116	.106	.071	.096	90	73	84	82	W	N W	N W	N 38 W	10.8	12.0	6.6	9.39	10.46	...	0.2
23	.882	.770	.649	.7548	5.9	5.5	13.1	8.40	—13.62	.050	.049	.077	.058	88	88	98	91	N E	N E	E	N 56 E	11.1	13.4	17.8	13.98	14.93	...	4.2
24	.392	.293	.431	.3723	12.4	12.4	11.8	11.98	—10.08	.070	.070	.071	.069	92	92	96	93	E	N E	N W	N 56 E	17.0	11.0	1.0	10.65	11.71	...	15.3
25	.606	.703	.793	.7145	—1.0	13.1	3.7	4.32	—17.80	.035	.059	.042	.043	84	75	82	80	W	W	N W	N 60 W	4.4	7.3	1.8	5.76	5.90	...	...
26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	S	N E	N 27 E	2.0	1.8	1.2	0.41	1.09	...	0.1
27	.497	.486	.557	.5205	14.2	23.0	16.4	18.50	— 3.73	.076	.098	.082	.086	93	79	90	86	N	N W	N W	N 20 W	0.5	5.0	5.8	3.55	4.22	...	0.2
28	.566	.672	.959	.7482	18.2	10.9	—9.2	5.32	—17.00	.088	.055	.023	.053	89	77	87	85	W	N W	N W	N 57 W	4.0	14.0	9.0	11.27	11.72	...	0.2
29	30.023	.916	.795	.9042	—16.4	1.9	—4.2	—5.75	—28.13	.020	.040	.034	.032	100	86	96	94	N W	S W	W	S 78 W	2.0	12.0	2.6	4.34	4.94	...	...
30	29.666	.529	.574	.5823	1.2	14.9	18.2	11.98	—10.45	.043	.067	.084	.066	94	79	86	86	S W	S W	W	S 54 W	8.2	20.0	6.0	9.35	9.83	...	...
31	.772	.710	.773	.7793	17.8	23.6	15.3	18.52	— 3.97	.086	.092	.071	.082	89	71	80	80	S W	W	N	S 78 W	5.6	4.5	13.7	5.22	6.96	...	0.1
	29.6197	29.5964	29.6274	29.6179	16.74	20.35	16.76	17.70	— 3.98	.094	.101	.093	.095	88	82	87	86	.....	.....	.....	.....	9.72	11.04	9.72	...	10.01	1.110	39.2

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR JANUARY, 1873.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....30.062 at Midn't on 14th } Monthly range=
Lowest Barometer.....29.042 at 2 p.m. on 21st } 1.020.

Self-registering Ther.
- Maximum temperature.....46°0 on 16th. } Monthly range=
- Minimum temperature.....—18°4 on 29th. } 64°4
- Mean maximum temperature.....25°23 } Mean daily range=
- Mean minimum temperature.....8°85 } 16°38.
- Greatest daily range.....37°9 from a.m. of 28th to p.m. of 29th.
- Least daily range.....5°4 from a.m. to p.m. of 24th.

Warmest day.....16th; mean temperature.....3.°58 }
Coldest day.....29th; mean temperature... —5°75 } Difference=41°33.

Maximum { Solar.....107°0 on 22nd } Monthy range=
Radiation { Terrestrial.....—27°0 on 29th } 134°0.

Aurora observed on 4 nights, viz:—3rd, 7th, 25th, 28th.

Possible to see Aurora on 12 nights; impossible on 19 nights.

Raining on 4 days; depth, 1.110 inches; duration of fall, 28.5 hours.

Snowing on 17 days; depth 39.2 inches; duration of fall 120.6 hours.

Mean of Cloudiness, 0.73.

WIND.

Resultant direction, N. 78° W.; resultant velocity, 2.96 miles.

Mean velocity, 10.01 miles per hour.

Maximum velocity, 31.0 miles, from Mid. to 1 a.m. of 6th.

Most windy day, 17th; mean velocity, 16.94 miles per hour.

Least windy day, 26th; mean velocity, 1.09 miles per hour.

Most windy hour, 1 p.m.; mean velocity, 11.90 miles per hour.

Least windy hour, 2 a.m.; mean velocity, 8.46 miles per hour.

Fog on the 13th and 16th.

Lightning on evening of 30th.

Solar halo on 30th; Lunar haloes, on 7th, 9th and 14th.

COMPARATIVE TABLE FOR JANUARY.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of Days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction	Velocity	Mean Velocity.
	°	°	°	°	°					°		
1845	26.5	+ 3.4	45.7	— 0.2	45.9	5	Imp.	9	22.7	...	...	0.70 lbs.
1846	26.7	+ 4.6	44.0	— 1.3	45.3	5	2.335	10	6.0	...	...	0.55
1847	23.3	+ 0.2	42.4	2.7	39.7	7	2.135	5	7.5	...	...	1.09
1848	28.7	+ 5.6	51.1	—11.4	62.5	7	2.245	8	7.1	N 82 W	2.03	5.82 mls.
1849	18.5	— 4.6	39.5	—14.2	53.7	4	1.175	10	9.2	S 63 W	3.00	6.71
1850	29.7	+ 6.6	46.4	9.9	36.5	5	1.250	8	5.2	N 37 W	0.09	5.80
1851	25.5	+ 2.4	43.4	—12.8	56.2	4	1.275	10	7.8	S 77 W	3.26	7.69
1852	18.4	— 4.7	37.3	—10.6	47.9	0	0.000	19	30.9	N 68 W	3.14	7.67
1853	23.0	— 0.1	40.9	— 9.7	50.6	1	0.290	3	7.5	N 27 W	2.52	6.34
1854	23.6	+ 0.5	46.4	— 5.4	51.8	7	1.270	11	7.5	N 77 W	2.44	6.91
1855	25.9	+ 2.8	49.0	— 5.4	54.4	5	0.525	13	23.3	N 73 W	1.91	7.26
1856	16.0	— 7.1	34.4	—12.0	46.4	0	0.000	14	13.6	N 75 W	5.24	10.69
1857	12.8	—10.3	37.2	—20.1	57.3	3	Inap	16	21.8	N 70 W	4.96	10.31
1858	30.0	+ 6.9	47.4	6.5	40.9	6	1.152	11	4.0	N 71 W	2.33	7.40
1859	26.4	+ 3.3	43.2	—26.5	69.7	6	1.449	19	16.4	S 81 W	3.17	8.76
1860	23.4	+ 0.3	46.4	— 6.8	53.2	6	0.740	16	8.7	N 89 W	6.09	9.37
1861	19.9	— 3.2	37.0	—11.2	48.2	4	0.685	23	20.6	N 86 W	2.92	9.30
1862	21.7	— 1.4	44.5	— 2.6	47.1	5	0.115	19	27.4	N 26 W	2.69	8.83
1863	28.1	+ 5.0	47.0	—14.0	61.0	10	1.122	17	20.6	N 61 W	1.13	7.23
1864	22.8	— 0.3	44.2	— 9.0	53.2	5	1.165	14	26.3	S 78 W	6.00	10.22
1865	17.7	— 5.4	37.2	— 9.0	46.2	1	0.440	18	14.8	N 85 W	4.80	9.39
1866	20.7	— 2.4	44.0	—14.0	58.0	4	0.522	19	10.3	N 75 W	2.98	9.34
1867	17.6	— 5.5	43.8	— 4.8	48.6	1	Inap.	21	42.0	N 55 W	3.27	6.96
1868	19.0	— 4.1	39.0	— 7.0	46.0	2	Inap.	21	14.6	S 83 W	3.97	8.91
1869	27.7	+ 4.6	45.6	— 1.0	46.0	4	0.887	12	9.8	S 72 W	3.40	9.21
1870	24.4	+ 1.3	45.0	— 3.2	48.2	8	3.412	18	21.3	S 89 W	2.63	8.98
1871	21.3	— 1.8	46.4	—13.2	59.6	8	0.864	23	43.6	S 49 W	2.56	9.84
1872	22.4	— 0.7	41.8	— 2.5	44.3	5	0.220	15	3.9	S 87 W	4.73	8.87
1873	17.7	— 5.4	46.0	—18.4	64.4	4	1.110	17	39.2	N 78 W	2.96	10.00
Res'lts to 1872.	23.07	...	43.20	—7.46	50.66	4.62	1.196	14.00	16 45	N 80 W	3.18	8.31
Excess for 1873	— 5.37	...	+ 2.80	10,94	13.74	0.61	0.086	— 3,00	+ 22.75	...	...	+ 1.69

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—FEBRUARY, 1873.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s. West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Aver'ge.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M	MEAN		6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.	M'N.	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M	Res'l-tant.	MEAN		
					°	°	°	°	°																		
1	29.795	29.813	29.916	29.8398	8.8	8.4	—5.5	3.28	—19.27	.062	.061	.028	.048	96	96	85	90	N W	N	W	N 33 W	7.8	11.5	5.2	9.60	10.19	...	0.2
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	S W	S W	S 69 W	8.4	10.4	6.4	9.42	9.73	...	...
3	.531	.377	.257	.3665	16.0	24.3	28.6	23.75	+ 1.08	.081	.104	.144	.117	90	79	92	89	N W	W	E	S 63 W	3.5	5.0	5.0	4.95	6.22	...	0.1
4	.026	.065	.495	.2113	35.5	40.5	29.0	34.58	+11.87	.206	.170	.126	.167	99	68	78	83	S W	W	N W	N 88 W	6.8	16.0	20.0	9.20	11.93	...	0.1
5	.720	.711	.688	.7047	22.8	30.8	29.0	27.78	+ 5.00	.113	.118	.133	.120	93	68	83	79	W	W	W	S 80 W	11.8	9.0	5.4	7.41	8.42	...	...
6	.629	.552	.603	.5989	26.5	38.4	27.5	30.73	+ 7.90	.126	.155	.121	.133	88	66	81	77	W	S W	N	S 60 W	3.2	9.9	3.4	5.07	5.71	...	...
7	.515	.280	.135	.3000	21.8	34.4	36.2	31.08	+ 8.18	.106	.151	.176	.148	91	74	83	84	N E	E	S W	S 83 E	4.0	4.5	2.8	1.54	2.57	...	...
8	.183	.200	.423	.2847	34 4	32.9	14.9	26.57	+ 3.60	.174	.153	.062	.126	87	82	73	81	S W	W	N W	N 84 W	9.6	19.6	24.0	15.41	16.57	...	0.1
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	N W	W	N 40 W	11.5	16.0	3.8	13.76	14.05	...	...
10	30.093	.821	.485	.7473	—2.8	16.0	20.0	11.30	—11.77	.034	.074	.093	.068	90	83	87	87	N	S E	S E	S 63 E	2.6	12.0	8.8	4.71	6.50	...	0.4
11	29.208	.295	.460	.3416	32.9	32.9	21.4	28.47	+ 5.36	.168	.125	.083	.129	90	65	72	79	S W	N W	N	N 68 W	16.4	17.6	8.6	9.28	12.29	...	0.1
12	.587	.612	.655	.6270	44.6	19.6	11.7	14.57	— 8.68	.071	.079	.040	.061	85	74	55	72	N	E	N E	N 35 W	13.4	12.8	12.6	8.18	9.62	...	Inap.
13	.782	.810	.827	.8113	1.9	16.9	14.9	9.53	—13.78	.040	.055	.069	.054	86	77	80	79	N	N E	E	N 37 E	9.2	11.8	11.4	9.01	9.50	...	...
14	.881	.936	30.029	.9577	9.9	15.6	10.9	12.02	—11.38	.060	.079	.061	.066	89	90	86	88	N E	N W	N W	N 17 E	10.5	5.2	4.8	5.26	6.47	...	0.4
15	30.114	30.035	29.852	.9803	5.2	23.2	23.9	17.32	— 6.18	.042	.096	.114	.084	75	77	90	80	N W	S E	E	N 46 E	2.8	1.2	9.1	1.98	3.67	...	...
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	N E	N E	N 57 E	8.4	15.4	6.6	9.80	10.17	...	...
17	29.683	29.808	.852	.7882	24.6	33.1	22.8	26.82	+ 3.12	.121	.115	.100	.112	91	61	82	77	N	E	E	N 16 E	15.2	3.6	1.5	5.65	6.39	...	...
18	.733	.540	.426	.5507	28.6	32.9	33.7	31.93	+ 8.13	.147	.139	.167	.152	92	74	86	83	E	E	Calm.	N 85 E	13.5	8.3	0.0	5.48	5.66	...	...
19	.388	.580	.726	.5928	36.6	33.7	30.1	32.62	+ 8.72	.196	.145	.150	.154	90	75	89	83	W	W	N W	S 88 W	23.2	19.6	13.6	13.59	14.42	...	...
20	.860	.769	.385	.6478	14.6	26.7	25.4	20.37	— 3.68	.075	.078	.111	.086	89	70	—	77	N	E	E	N 63 E	2.0	8.0	19.7	3.48	8.83	...	Inap.
21	28.907	.002	.232	.0535	28.6	24.3	12.4	21.22	— 3.00	.144	.097	.062	.099	92	74	80	81	E	W	W	S 78 W	14.2	28.5	15.0	6.82	19.31	...	2.0
22	29.321	.353	.384	.3575	6.6	14.2	8.0	9.90	—14.42	.053	.055	.048	.057	90	78	78	83	W	W	W	N 89 W	7.2	18.2	19.0	12.01	12.28	...	...
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	W	W	N 87 W	10.0	19.0	13.0	14.87	15.06	...	...
24	.337	.332	.412	.3685	—0.2	14.9	18.2	11.72	—12.90	.034	.069	.075	.061	85	80	76	80	S W	W	W	S 82 W	12.6	23.6	16.6	18.55	18.73	...	...
25	.495	.566	.679	.5895	21.0	26.8	22.1	23.55	— 1.25	.096	.109	.102	.104	83	75	86	82	N W	W	W	N 76 W	14.4	21.0	6.5	13.31	13.56	...	...
26	.741	.728	.446	.6138	15.2	26.8	25.7	23.42	— 1.58	.072	.109	.107	.098	82	75	77	77	N W	E	E	N 8 E	1.4	7.0	23.0	6.13	9.86	...	...
27	.118	.265	.487	.3018	26.8	29.7	14.9	23.45	— 1.72	.140	.110	.063	.104	96	67	73	79	E	W	N W	S 5 E	15.0	16.0	7.6	1.78	13.17	...	7.0
28	.659	.777	.861	.7828	6.6	27.9	23.9	20.20	— 5.20	.053	.124	.095	.091	90	81	74	80	N W	W	N W	N 70 W	8.2	6.8	4.6	4.58	4.90	...	...
	29.5510	29.5652	29.5710	29.5590	18.19	25.54	20.82	21.51	— 2.13	.101	.107	.097	.102	89	75	80	81	.....	.....	.....	.....	10.4	12.77	9.93	...	10.21	...	10.4

REMARKS ON TORONTO METOROLOGICAL REGISTER FOR FEBRUARY, 1873.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 A.M., 10 P.M., and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....30.123 at 8 a.m. on 15th. } Monthly range
Lowest Barometer.....28.848 at 8 a.m. on 21st. } 1.275.

Self-registering Ther.
- Maximum Temperature .....43°0 on 4th. } Monthly range
- Minimum Temperature ..... —10°5 on 2nd. } 53.5.
- Mean Maximum Temperature .....27°09. } Mean daily range
- Mean Minimum Temperature .....10°02. } 17°07.
- Greatest daily range.....36°4 from 8 a.m. of 10th to 8 a.m. of 11th.
- Least daily range.....9°3 from a.m to p.m. of 14th.

Warmest day .....4th...Mean Temperature .....34.58 } Difference=31°30.
Coldest day.....1st...Mean Temperature ..... 3.28 }

Maximum } Solar .....126°5 on 21st. } Monthly range
Radiation } Terrestrial.....—21°4 on 2nd. } 147.9.

Aurora observed on 3 nights, viz.: 1st, 21st and 23rd.

Possible to see Aurora on 16 nights; impossible on 12 nights.

Snowing on 11 days; depth 10.4 inches; duration of fall 42.5 hours.

Mean of Cloudiness, 0.59.

WIND.

Resultant Direction N. 68° W.; Resultant Velocity 4.29 miles.

Mean Velocity 10.21 miles per hour.

Maximum Velocity 31.5 miles, from 1 to 2 p.m. of 21st.

Most Windy day 21st; Mean Velocity 19.31 miles per hour.

Least Windy day 7th; Mean Velocity 2.57 miles per hour.

Most Windy hour 1 p.m.; Mean Velocity 13.53 miles per hour.

Least Windy hour 3 a.m.; Mean Velocity 8.60 miles per hour.

Solar haloes on 10th, 15th, 16th, 17th and 23rd.

Lunar haloes on 13th and 15th.

Large Meteor in S. W. at 10 p.m. of 2nd.

COMPARATIVE TABLE FOR FEBRUARY.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Vel'y	Mean Velocity.
	°	°	°	°	°							
1845	26.0	+ 3.0	49.1	— 4.2	53.3	5	Imp.	9	19.0	°	...	0.991bs
1846	20.4	— 2.6	41.9	—16.7	58.6	0	0.000	13	46.1	...	...	0.65
1847	21.5	— 1.5	40.9	0.0	40.9	2	0.550	13	27.3	...	...	0.69
1848	26.6	+ 3.6	46.6	0.0	46.6	4	0.775	8	10.8	N 65 W	2.53	5.69mls
1849	19.5	— 3.5	40.6	— 9.8	50.4	2	0.240	13	19.2	N 41 W	1.48	6.58
1850	26.0	+ 3.0	49.6	2.2	47.4	7	1.235	9	23.1	N 80 W	3.48	7.61
1851	27.6	+ 4.6	50.2	2.0	48.2	7	2.600	4	2.4	N 64 W	1.99	6.94
1852	23.4	+ 0.4	41.2	— 6.2	47.4	3	0.650	11	13.0	S 75 W	3.34	6.42
1853	24.1	+ 1.1	43.4	— 1.4	44.8	4	1.030	15	12.6	N 49 W	2.51	7.30
1854	21.1	— 1.9	42.8	—10.8	53.6	5	1.460	15	18.0	N 7 E	1.73	6.91
1855	15.4	— 7.6	39.0	—25.4	64.4	2	1.770	14	21.8	N 40 W	4.34	8.17
1856	15.7	— 7.3	37.8	—18.7	56.5	0	0.000	8	9.7	N 81 W	7.70	10.71
1857	28.5	+ 5.5	52.4	— 5.9	58.3	11	3.050	11	11.7	S 78 W	3.68	9.82
1858	17.0	— 6.0	42.4	— 7.3	49.7	1	inapp.	16	26.7	N 72 W	3.22	9.12
1859	26.0	— 3.0	46.2	2.1	44.1	6	0.455	14	8.3	N 54 W	2.72	8.50
1860	22.8	— 0.2	50.2	— 8.5	58.7	7	1.330	13	18.8	N 61 W	3.28	8.73
1861	26.1	+ 3.1	46.0	—20.8	66.8	4	0.815	17	29.7	N 77 W	3.86	10.58
1862	22.5	— 0.5	37.8	— 5.2	43.0	3	0.180	17	23.1	N 55 W	3.93	8.52
1863	22.4	— 0.6	41.5	—19.8	61.3	7	1.450	12	22.0	N 23 W	2.27	10.13
1864	24.3	+ 1.3	45.0	—15.0	60.0	2	0.397	14	9.5	S 84 W	6.48	10.11
1865	22.4	— 0.6	42.2	—10.0	52.2	5	0.810	11	16.8	N 23 W	3.95	8.23
1866	22.5	— 0.5	45.0	— 8.0	53.0	3	0.830	12	16.0	S 80 W	5.14	9.40
1867	28.9	+ 5.9	44.0	0.2	43.8	8	1.328	13	13.4	N 57 W	1.58	8.85
1868	17.2	— 5.8	45.0	—11.5	56.5	1	0.040	16	32.8	N 69 W	3.23	10.84
1869	25.0	+ 2.0	46.0	— 1.0	47.0	2	0.165	19	39.7	N 34 W	4.18	10.04
1870	21.5	— 1.5	40.6	— 6.6	47.2	2	0.520	18	20.1	N 29 W	2.84	8.10
1871	24.3	+ 1.3	48.0	—15.8	63.8	3	0.040	15	23.0	N 70 W	4.26	9.87
1872	20.7	— 2.3	45.2	— 3.6	48.8	5	0.350	9	7.3	N 61 W	3.32	8.93
1873	21.5	— 1.5	43.0	—10.5	53.5	0	0.000	11	10.4	N 68 W	4.29	10.21
Res'lts to 1872.	22.95	...	44.31	—8.06	52.37	4.03	0.877	12.45	18.91	N 66 W	3.15	8.64
Excess for '73.	1.44	...	1.31	2.44	1.13	4.03	0.877	1.45	8.51			+ 1.57

MONTHLY METEROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO,—MARCH, 1873.

Latitude—43°39′4 *North*. *Longitude*—5*h*. 17*m*. 33*s*. *West*. *Elevation above Lake Ontario*, 108 *feet*.

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal	Tension of Vapour.				Relative Humidity				Direction of Wind.			Resultant.	Velocity of Wind.					Rain in Inches.	Snow in Inches.
	6 A. M.	2 P. M.	10 P. M.	Mean.	6 A.M.	2 P.M.	10 PM	ME'N.		6 A. M.	2 . P. M.	10 P.M.	M'N.	6 A. M.	2 P. M.	10 P.M.	M'N.	6 A. M.	2 P. M.	10 P. M		6 A. M.	2 P. M.	10 P.M.	Res'l-tant.	MEAN		
1	29.869	29.816	29.766	29.8157	10.9	34.0	29.0	25.53	— 0.03	.061	.156	.147	.118	86	79	92	83	W	S W	Calm.	N 83 W	2.8	4.9	0.0	2.13	2.50	...	0.1
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S W	N W	N 59 W	1.4	3.9	2.4	2.61	3.58	...	0.6
3	.583	.671	.774	.6898	12.4	3.4	4.4	5.47	—20.55	.066	.045	.050	.049	89	90	95	89	N	N W	N W	N 30 W	19.0	28.0	19.4	19.23	20.27	...	2.1
4	88.	30.932	30.128	30.0308	—0.2	7.3	1.9	3.25	—23.00	.036	.046	.040	.041	85	75	86	82	N W	N W	N W	N 36 W	16.8	16.0	9.0	13.86	14.09	...	...
5	30.220	30.205	30.192	30.2080	—5.7	21.4	12.0	10.02	—16.50	.030	.065	.061	.053	93	56	80	75	W	S W	W	S 74 W	4.6	11.0	4.8	5.35	6.16	...	...
6	30.156	30.024	29.899	30.0173	8.4	31.1	39.4	24.15	+ 2.62	.054	.145	.146	.119	87	83	86	85	W	S W	S W	S 38 W	3.4	15.2	9.6	6.88	7.37	...	...
7	29.827	29.656	.456	29.6268	29.7	42.3	39.4	37.92	+10.92	.147	.173	.193	.170	89	64	80	75	S W	S W	S W	S 41 W	2.0	12.8	9.1	6.80	6.84	...	...
8	.175	.127	.240	.1882	39.1	34.8	25.7	32.52	+ 5.22	.205	.146	.114	.153	86	72	82	80	S W	W	W	S 71 W	19.0	23.3	36.7	15.70	17.40	...	0.8
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	N W	N	N 60 W	17.4	1.8	7.2	7.48	10.37	...	...
10	.547	.556	.386	.5048	20.7	32.2	31.1	28.47	+ 0.60	.092	.186	.153	.126	82	69	87	79	N W	S	E	S 10 E	1.4	12.6	10.5	2.14	8.58	...	...
11	28.934	.155	.340	.1627	33.7	36.6	29.3	32.53	+ 4.40	.184	.127	.144	.154	95	59	89	84	S W	W	W	S 86 W	4.4	25.0	8.5	10.65	13.90	.450	0.2
12	29.448	.555	.714	.5860	24.3	30.8	27.9	27.72	— 0.75	.111	.142	.131	.127	85	82	86	84	W	N W	W	N 79 W	8.8	21.4	12.2	11.90	12.56	..	0.1
13	.780	.750	.794	.7813	21.9	35.5	31.9	29.87	+ 1.10	.098	.132	.136	.121	83	63	75	73	N W	W	W	N 85 W	11.5	12.8	10.0	9.31	10.73	...	...
14	.959	.980	.818	.9103	25.7	39.4	35.5	34.37	+ 5.28	.114	.109	.132	.124	82	45	63	64	N W	S W	E	S 68 W	0.4	3.0	7.0	1.42	4.27	...	...
15	.537	.300	28.916	.2323	35.5	37 3	43.0	38.65	+ 9.23	.202	.221	.256	.223	97	99	93	95	E	S	W	S 20 W	10.0	5.2	39.0	4.08	9.42	.080	...
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W	N W	N W	N 73 W	35.5	33.4	27.8	30.37	31.38	...	0.2
17	.952	.950	29.854	.9073	25.7	37.6	31.5	31.87	+ 1.78	.114	.114	.133	.121	82	49	75	68	W	S	S W	N 69 W	12.0	8.4	3.5	8.55	9.59	..	...
18	.644	.304	.300	.3933	31.5	32.9	31.5	31.62	+ 1.18	.148	.160	.170	.154	83	86	89	86	E	E	W	N 88 E	6.6	6.2	2.6	4.23	5.10	...	0.7
19	.424	.415	.374	.3983	27.5	40.9	36.2	35.05	+ 4.28	.135	.182	.193	.172	90	71	90	84	N W	S	E	S 66 W	4.5	4.4	7.6	2.02	5.39	.030	...
20	.217	.120	28.975	.0968	36.6	32.9	31.1	32.77	+ 1.65	.196	.178	.175	.175	90	94	100	94	E	E	N	N 76 E	6.8	11.8	7.3	8.87	10.65	.190	4.0
21	28.935	28.934	29.028	28.9747	26.1	31.1	28.6	28.48	— 2.98	.131	.159	.144	.144	93	91	92	92	W	S W	N W	N 85 W	13.0	11.3	9.2	12.83	13.39	...	3.5
22	29.261	29.446	.527	29.4250	26.8	35.1	28.6	30.18	— 1.65	.137	.121	.115	.121	94	59	74	73	N W	N W	W	N 58 W	20.2	9.0	5.1	13.21	14.36	...	...
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S W	W	N W	N 83 W	7.2	26.8	7.0	12.31	13.81	...	Inap.
24	.771	.742	.713	.7437	8.8	17.8	18.2	15.42	—17.18	.050	.066	.088	.072	78	68	89	81	N	E	N E	N 33 E	1.4	5.3	13.0	6.34	7.47	...	...
25	.654	.597	.437	.5443	14.6	20.3	18.2	17.98	—14.95	.078	.090	.088	.086	93	82	89	88	N E	N E	N E	N 53 E	17.0	14.0	15.2	14.7	14.75	...	2.0
26	.132	.109	.437	.2437	20.3	21.8	13.5	17.98	—15.32	.102	.099	.066	.086	94	84	83	86	N E	N	N W	N 2 W	18.6	19.4	32.0	17.93	20.46	...	9.7
27	.720	.811	.783	.7835	7.7	24.3	23.2	19.53	—14.15	.056	.090	.101	.086	93	69	82	81	N W	S W	S W	N 67 W	5.4	9.2	8.0	8.84	12.32	...	...
28	.763	.506	.343	.5062	10.9	34.4	35.8	29.57	— 4.48	.061	.136	.173	.132	86	69	82	78	N	E	E	S 78 E	2.2	15.4	2.6	4.56	6.62	...	...
29	.038	28.822	28.924	28.9232	38.0	38.0	35.1	36.37	+ 1.92	.220	.220	.173	.198	96	96	84	91	E	N W	N W	N 20 W	5.6	7.0	38.2	10.08	13.57	.400	Inap.
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	W	N E	N 63 W	32.6	16.0	2.6	18.70	20.53	...	...
31	.038	29.296	29.570	29.3223	32.6	37.6	29.7	34.20	— 0.98	.179	.166	.147	.166	97	73	89	85	Calm.	N W	W	N 59 W	0.0	12.5	1.0	3.76	7.73	...	1.2
	29.5564	29.5338	29.5265	29.5391	21.69	30.42	27.03	26.60	— 3.37	.116	.131	.134	.127	89	74	85	82	.....	.....	.....	.....	10.35	13.13	11.87	...	11.47	1.756	25.2

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR MARCH, 1873.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M, and midnight. The means and resultants of the wind are from hourly observations.

Highest Barometer.....30.246 at 8 a.m. on 5th. } Monthly range
Lowest Barometer.....28.797 at 4 p.m. on 29th. } 1.449.

Self registering Ther.
- Maximum temperature.....45°0 on 15th. } Monthly range
- Minimum temperature.....—6.0 on 5th } 51°0
- Mean maximum temperature.....34°03 } Mean daily range
- Mean Minimum temperature.....11°38 } 15°81
- Greatest daily range.....32°3 from p.m. of 2nd to p.m. of 3rd.
- Least daily range..... 4°5 from noon to midnight of 18th.

Warmest day.....15th; mean temperature 38°65 } Difference=35°40
Coldest day..... 4th; mean temperature 3°25 }

Maximum Radiation { Solar .....137°0 on 22nd. / Terrestrial ..... -16°0 on 5th. } Monthly range=153°0

Aurora observed on 4 nights, viz: 21st, 22nd, 23rd and 27th.

Possible to see aurora on 14 nights; impossible on 17 nights.

Snowing on 15 days; depth, 25.2 inches; duration of fall, 103.0 hours.

Raining on 5 days; depth, 1.756 inches; duration of fall, 37.7 hours.

Mean of cloudiness, 0.67.

WIND.

Resultant direction, N. by W.; Resultant velocity, 5.91 miles.
Mean velocity, 11.47 miles per hour.

Maximum velocity, 47.5 miles, from 10.30 to 11.30 p.m. of 15th.

Most windy day, 16th; mean velocity, 31.38 miles per hour.

Least windy day, 1st; mean velocity, 2.50 miles per hour.

Most windy hour, noon; mean velocity 13.34 miles per hour.

Least windy hour, 8 p.m.; mean velocity, 9.68 miles per hour.

Solar haloes on 1st, 2nd, 6th, 17th and 27th. Lunar haloes on 10th and 18th.

Blue birds, 17th; Robins, 23rd.

It will be noticed from the comparative table that this is the most windy March except 1860, and that both the greatest velocity in one day (31.4 miles per hour), and the largest absolute velocity in one hour (47.5) occurred in this month. The month has also been marked by an excess of rain and snow, low temperature as regards the average and the extremes. The barometric pressure has also been much below the average, and marked by rapid and large fluctuations.

COMPARATIVE TABLE FOR MARCH.

YEAR.	TEMPERATURE. Mean.	Excess above Average.	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction.	Velocity.	Mean Velocity.
	°	°	°	°	°					°		
1845	35.4	+ 6.0	62.7	6.6	56.1	5		8	2.8	...	...	0.66 lbs.
1846	33.1	+ 3.7	49.6	8.3	41.3	9	1.965	5	2.3	...	...	0.30
1847	26.2	— 3.2	43.9	5.6	38.3	5	0.850	6	4.2	...	...	0.71
1848	28.6	— 0.8	58.6	0.0	58.6	5	1.220	6	9.7	N 66 W	2.03	5.80mls.
1849	33.5	+ 4.1	53.0	15.1	37.9	7	1.525	2	2.3	N 3 W	1.48	5.37
1850	29.8	+ 0.4	46.5	7.2	39.3	2	0.745	7	11.2	N 52 W	2.62	7.62
1851	32.4	+ 3.0	59.3	12.0	47.3	3	0.770	9	8.8	N 21 W	1.93	7.65
1852	27.7	— 1.7	44.8	— 7.4	52.2	8	3.080	12	19.5	N 8 W	0.71	5.81
1853	30.6	+ 1.2	56.3	0.0	56.3	6	1.080	8	7.1	N 58 W	2.60	5.96
1854	30.7	+ 1.3	55.1	7.4	47.7	9	2.425	3	2.8	N 53 W	3.39	8.03
1855	28.5	— 0.9	49.4	— 2.9	52.3	5	1.485	11	18.1	N 88 W	4.76	9.95
1856	23.1	— 6.3	41.4	—14.0	55.4	0	0.000	12	16.2	N 71 W	7.68	11.39
1857	27.8	— 1.6	57.6	— 5.5	63.1	4	0.335	15	11.3	N 63 W	6.63	10.84
1858	28.4	— 1.0	55.4	— 5.5	60.9	10	0.917	6	0.2	N 58 W	5.45	8.56
1859	36.3	+ 6.9	54.2	9.8	44.4	15	4.054	8	1.0	N 64 W	1.96	10.39
1860	34.5	+ 5.1	67.0	12.8	54.2	5	0.882	11	2.4	N 64 W	7.61	12.41
1861	26.9	— 2.5	47.4	— 5.2	52.6	8	2.125	14	7.1	N 54 W	4.33	10.56
1862	28.8	— 0.6	43.2	8.0	35.2	8	2.560	11	18.5	N 12 W	2.50	9.38
1863	25.8	— 3.6	42.2	— 4.0	46.2	4	0.687	17	11.4	N 27 W	2.62	9.27
1864	29.1	— 0.3	50.2	3.0	47.2	9	1.620	12	3.7	N 53 W	2.29	8.41
1865	33.6	+ 4.2	55.6	— 3.5	59.1	10	3.050	12	18.9	N 61 W	2.16	8.80
1866	27.6	— 2.8	45.8	7.5	38.3	8	1.915	18	7.2	N 73 W	6.84	11.51
1867	26.6	— 2.8	46.8	3.0	43.8	6	0.617	14	33.4	N 34 W	2.12	8.52
1868	31.3	+ 1.9	59.0	—15.6	74.6	7	2.660	5	4.2	N 21 W	2.12	8.58
1869	23.1	— 6.3	46.8	— 5.4	52.2	3	0.985	9	15.0	N 52 W	2.86	8.02
1870	26.3	— 3.1	44.0	5.2	38.8	2	0.755	18	62.4	N 18 E	4.73	10.13
1871	34.7	+ 5.3	58.5	17.0	41.5	8	2.782	12	13.0	N 31 W	2.59	8.31
1872	19.9	— 9.5	46.4	—10.8	57.2	2	0.700	14	16.3	N 66 W	5.36	10.48
1873	26.6	— 2.8	45.0	— 6.0	51.0	5	1.756	15	25.2	N 61 W	5.91	11.47
Res'lts to 1872	29.38	.....	51.45	1.74	46.71	6.09	1.588	10.12	12.36	N 51 W	3.22	8.87
Excess for '73.	— 2.78	.....	— 6.45	— 7.74	+ 1.29	— 1.09	+ 0.168	+ 4.88	+ 12.84	...	...	+ 2.60

MONTHLY METEOROLOGICAL REGISTER, AT THE MAGNETICAL OBSERVATORY, TORONTO, ONTARIO—APRIL, 1873.

Latitude—43° 39′4 *North.* *Longitude*—5*h.* 17*m.* 33*s.* *West.* *Elevation above Lake Ontario*, 108 *feet.*

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of Mean above Normal.	Tension of Vapour.				Humidity of Air.				Direction of Wind.			Resultant.	Velocity of Wind.				Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 PM	MEAN		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Result'.	MEAN		
					°	°	°	°																				
1	29.648	29.539	29.199	29.4373	26.8	36.2	35.8	33.97	— 1.63	.122	.159	.173	.159	85	74	82	81	W	E	E	N 77 E	0.6	13.4	22.6	8.67	9.54	0.170	...
2	.087	.192	.342	.2242	36.2	39.8	36.2	36.48	+ 0.50	.209	.189	.176	.186	98	76	81	86	S E	S W	S W	S 41 W	2.2	23.5	16.2	9.27	12.33	.050	...
3	.470	.532	.668	.5752	35.5	43.0	35.8	38.40	+ 2.03	.145	.164	.148	.149	69	59	70	64	W	W	N W	N 83 W	14.0	20.0	2.8	11.55	12.04	...	...
4	.780	.778	.744	.7730	33.3	38.0	35.8	35.83	— 0.90	.170	.144	.134	.149	89	63	63	71	Calm.	E	E	N 79 E	0.0	15.0	21.0	8.56	8.74	.100	...
5	.726	.688	.624	.6507	35.8	35.8	37.6	36.60	— 0.53	.173	.206	.217	.199	82	98	96	91	N E	E	E	N 70 E	22.2	21.0	10.0	15.89	16.29	.070	...
6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N E	S E	N	N 54 E	4.0	3.4	2.8	2.15	2.86	.330	...
7	.534	.447	.453	.4705	36.2	37.3	37.4	37.10	— 0.80	.209	.221	.219	.215	98	99	98	97	E	E	W	N 81 E	7.8	7.2	1.0	4.19	4.38	.120	...
8	.474	.479	.590	.5103	39.4	39.8	36.9	38.05	— 0.23	.240	.225	.209	.218	99	92	95	95	N	N E	N E	N 24 E	3.0	7.6	11.6	5.93	6.86	.690	...
9	.381	.342	.388	.3743	35.1	36.2	35.5	36.05	— 2.62	.190	.215	.209	.202	93	100	100	95	E	Calm.	W	N 77 E	19.2	0.0	6.8	7.41	9.07	.875	...
10	.495	.625	.707	.6198	36.6	42.7	35.1	38.93	— 0.12	.162	.188	.177	.181	75	68	86	76	S W	S W	Calm.	S 50 W	14.6	16.0	0.0	11.16	11.23	...	...
11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E	E	E	N 77 E	3.4	12.0	10.8	8.27	8.43	.020	...
12	.517	.568	.594	.5668	36.9	47.4	44.1	42.57	+ 2.77	.200	.208	.242	.208	91	63	84	77	Calm.	S	N	N 58 E	0.0	4.6	3.6	1.96	4.83	...	...
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	N	N W	N 24 W	12.2	20.0	15.2	15.38	15.60	...	...
14	.658	.561	.553	.5902	39.1	53.5	43.8	45.82	+ 5.25	.163	.147	.192	.168	68	36	66	56	N W	N W	N W	N 31 W	10.5	25.5	17.2	14.53	14.78	...	...
15	.564	.659	.725	.6630	39.4	45.2	39.1	42.08	+ 1.15	.142	.172	.180	.165	58	57	75	62	N	S E	E	N 72 E	9.1	13.0	3.0	6.03	10.82	...	...
16	.723	.682	.657	.6757	38.7	45.9	38.7	40.80	— 0.52	.177	.182	.222	.195	75	58	94	77	E	E	E	N 84 E	16.2	21.0	15.5	17.01	17.19	.440	...
17	.556	.464	.359	.4467	35.1	34.7	34.4	34.73	— 6.97	.198	.187	.191	.192	97	93	96	95	E	E	N E	N 76 E	11.2	17.7	8.6	13.35	13.53	.380	Inap.
18	.238	.190	.210	.2085	33.3	38.7	36.6	36.85	— 5.20	.180	.211	.204	.199	95	90	94	91	N E	S	S	N 59 E	3.6	5.0	2.9	1.02	3.65	.090	Inap.
19	.228	.298	.486	.3523	36.2	43.8	34.8	37.95	— 4.48	.201	.200	.139	.179	94	70	69	78	S W	N W	N W	N 44 W	3.5	21.0	11.8	10.08	11.19	.040	...
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S	N	N 65 W	11.5	7.8	5.0	3.40	5.66	...	...
21	.468	.476	.521	.4867	29.3	41.6	33.3	35.47	— 7.72	.109	.123	.142	.123	67	46	74	60	N	S	N W	N 32 W	7.0	11.2	12.2	1.52	7.82	...	...
22	.533	.508	.595	.5455	31.9	40.5	30.8	34.77	— 8.78	.143	.103	.112	.121	79	40	64	60	N	S	N W	N 6 W	10.2	7.2	15.8	4.85	10.42	...	...
23	.651	.586	.626	.6233	27.9	42.0	36.9	35.60	— 8.35	.110	.160	.175	.153	71	59	79	73	N	S W	N	N 14 W	6.1	8.0	12.5	5.95	8.08	...	...
24	.618	.561	.527	.5565	33.7	41.6	30.8	35.30	— 9.00	.175	.132	.149	.151	90	49	87	75	N W	S W	N	N 62 W	4.0	6.8	0.2	3.08	3.85	...	...
25	.422	.360	.378	.3837	30.4	38.7	32.6	34.27	—10.40	.146	.202	.149	.165	86	86	80	81	N W	S W	N W	S 40 W	2.8	2.2	4.2	2.73	4.05	...	Inap.
26	.400	.456	.554	.4785	32.6	45.2	34.4	37.82	— 7.20	.158	.191	.158	.169	85	63	79	74	W	N W	N W	N 62 W	8.8	22.3	10.0	10.65	11.20	...	...
27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N W	S	S W	N 88 W	11.7	6.6	3.2	3.54	6.6	...	...
28	.718	.632	.570	.6353	37.6	48.8	40.2	42.98	— 2.78	.175	.135	.115	.139	77	39	46	51	Calm.	S E	S E	S 64 E	0.0	8.0	3.6	2.45	4.52	...	...
29	.584	.579	.658	.6163	39.4	52.1	44.5	46.53	+ 0.43	.163	.146	.135	.156	67	37	46	50	N E	E	W	N 83 E	3.4	9.5	6.5	3.95	5.87	...	...
30	.775	.778	.844	.8087	42.3	57.1	44.9	49.47	+ 2.98	.219	.262	.139	.205	81	56	47	58	N W	S W	N	N 40 W	13.0	8.0	6.6	7.54	9.80	...	...
	29.5299	29.5192	29.5429	29.5310	35.15	42.62	37.04	38.58	— 2.51	.171	.179	.172	.174	83	67	78	75	.....	.....	.....	.....	7.80	12.15	9.34	.....	9.05	3.975	Inap.

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR APRIL, 1873.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 6 A.M., 8 A.M., 2 P.M., 4 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer.....29.844 at 10 p.m. on 30th } Monthly range
Lowest Barometer.....29.087 at 6 p.m. on 2nd } 0.757.

Self-registering Ther.
- Maximum Temperature .....61°2 on 30th } Monthly range
- Minimum Temperature .....24°4 on 23rd } 36°8.
- Mean Maximum Temperature .....46°76 } Mean daily range
- Mean Minimum Temperature .....32°07 } 14°69.
- Greatest daily range.....25°7 from a.m. to p.m. of 14th.
- Least daily range .....3°1 from a.m. to p.m. of 9th.

Warmest Day.....30th ... Mean Temperature.....49°47 } Difference=15°50.
Coldest Day .....1st ... Mean Temperature.....33°97 }

Maximum { Solar.....123°5 on 13th } Monthly range
Radiation { Terrestrial .....15°0 on 23rd } 108°5.

Aurora observed on 9 nights, viz., 2nd, 15th, 18th, 19th, 20th, 21st, 25th, 26th and 30th.

Possible to see Aurora on 18 nights; impossible on 12 nights.

Snowing on 3 days; depth inapp.; duration of fall 5.3 hours.

Raining on 13 days; depth 3.975 inches; duration of fall 124.7 hours.

Mean of Cloudiness, 0.68.

WIND.

Resultant Direction N. 18° E.; Resultant Velocity 2.89 miles.

Mean Velocity 9.05 miles per hour.

Maximum Velocity 26.6 miles, from 1 p.m. to 2 p.m. of 14th.

Most Windy day 16th; Mean Velocity 17.10 miles per hour.

Least Windy day 18th; Mean Velocity 3.05 miles per hour.

Most Windy hour 2 p.m.; Mean Velocity 12.15 miles per hour.

Least Windy hour 2 a.m.; Mean Velocity 6.79 miles per hour.

Fog on 6th, 7th and 9th.

Solar haloes on 1st and 28th. Lunar halo on 3rd.

5th—First Thunder storm of the year, extending over a large part of Canada, and causing a considerable destruction of life and property. 11th—Bay clear of ice. 17th—*City of Toronto's* first trip. 12th—Woodpeckers seen. 24th—Swallows seen, 18 days later than last year.

COMPARATIVE TABLE FOR APRIL.

YEAR.	TEMPERATURE. Mean.	Excess above aver'ge	Maximum.	Minimum.	Range.	RAIN. No. of days.	Inches.	SNOW. No. of days.	Inches.	WIND. Resultant. Direction	Velo'y	Mean Velocity.
	°	°	°	°	°					°		
1845	42.1	+ 1.0	66.7	15.5	51.2	11	3.290	4	5.5	...	...	1.06 lbs
1846	44.0	+ 2.9	81.8	24.2	57.6	10	1.300	2	1.3	...	...	0.55
1847	39.2	— 1.9	65.1	9.3	55.8	8	2.870	2	4.0	...	...	.59
1848	41.3	+ 0.2	65.1	22.7	42.4	5	1.455	1	0.5	N 77 W	1.46	4.89mls
1849	39.0	— 2.1	72.0	15.5	56.5	10	2.655	2	1.7	N 43 W	3.14	7.50
1850	37.9	— 3.2	65.7	18.8	47.7	7	1.720	2	1.1	N 50 E	1.12	7.64
1851	41.3	+ 0.2	59.3	25.8	33.5	11	2.295	3	1.2	N 14 E	2.52	8.07
1852	38.2	— 2.9	53.8	20.0	33.8	6	1.990	4	9.4	N 23 E	2.44	6.68
1853	41.9	+ 0.8	65.7	25.0	40.7	10	2.625	1	1.0	N 12 W	1.95	5.20
1854	41.0	— 0.1	64.5	20.2	44.3	12	2.685	4	2.7	N 50 E	2.57	6.81
1855	42.4	+ 1.3	69.4	10.7	58.7	8	2.030	3	1.6	N 36 W	3.99	7.57
1856	42.3	+ 1.2	72.2	14.2	58.0	13	2.780	3	0.1	N 29 E	1.64	6.05
1857	35.4	— 5.7	52.0	5.9	46.1	10	1.755	11	12.9	N 60 W	4.15	10.24
1858	41.5	+ 0.4	65.2	21.8	43.4	13	1.642	2	0.1	N 14 W	1.64	9.57
1859	39.5	— 1.6	64.8	22.6	42.2	9	2.527	8	1.2	N 36 W	2.33	10.79
1860	39.5	— 1.6	61.8	19.5	42.3	11	1.282	5	0.3	N 37 W	4.10	10.39
1861	42.0	+ 0.9	67.0	23.8	43.2	12	1.619	4	6.9	N 57 E	2.31	8.90
1862	39.6	— 1.5	68.0	14.5	53.5	10	2.235	4	0.2	N 50 E	2.48	9.77
1863	42.0	+ 0.9	69.0	8.6	60.4	8	2.210	4	1.6	N 14 E	3.75	9.20
1864	40.9	— 0.2	59.4	28.1	31.3	16	3.633	3	3.5	N 41 E	3.39	7.77
1865	43.1	+ 2.0	62.5	23.0	39.5	17	3.972	6	2.0	N 84 W	2.11	8.39
1866	43.9	+ 2.8	71.0	28.5	42.5	7	1.675	2	inap.	N 42 W	3.34	7.95
1867	39.5	— 1.6	65.5	25.4	40.1	12	2.147	5	7.2	N 51 W	2.68	7.89
1868	38.0	— 3.1	64.0	9.2	54.8	7	0.990	10	5.3	N 63 W	2.43	9.24
1869	40.1	— 1.0	72.2	16.6	55.6	9	2.965	6	0.5	N 59 W	4.03	8.91
1870	44.6	+ 3.5	67.0	29.6	37.4	9	2.145	2	0.1	N 40 E	3.55	7.03
1871	43.0	— 1.9	72.8	26.4	46.4	17	3.318	2	1.3	N 48 W	1.86	8.85
1872	40.5	— 0.6	70.0	22.7	47.3	9	0.910	5	0.7	N 68 W	3.84	9.12
1873	38.6	— 2.5	61.2	24.4	36.8	13	3.975	3	inap.	N 18 E	2.89	9.05
Results to 1872.	41.11	...	66.20	19.55	46.65	9.97	2.453	3.67	2.32	N 21 W	2.07	8.17
Excess for '73.	— 2.53	...	— 5.00	+ 4.85	— 9.85	+ 3.02	+ 1.522	— 0.67	— 2.3	...	...	+ 0.88

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